CLIENT: Dalradian Gold Ltd.

PROJECT: Transboundary submission Report Re: potential Transboundary Air Quality Impact and Updated Air Dispersion Modelling and Air Quality Impact Assessment Report for the Curraghinalt Gold Mine Project.

Prepared by: AONA Environmental Consulting Ltd.

Date: November 2025

REPORT CONTROL

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1 Introduction

1.1 This report responds to the information contained within Transboundary Representations (TRs) prepared by parties located in the Republic of Ireland (RoI) and in Northern Ireland (NI) in relation to the potential air quality impact of the proposed Curraghinalt Gold Mine Project (Planning Application Ref: LA10/2017/1249/F, PAC Ref C005).

1.2 This report also contains an updated Air Dispersion Modelling and Air Quality Impact Assessment Report for the Curraghinalt Gold Mine Project in relation to nitrogen oxide (NOx), nitrogen deposition (NDep) and nitrogen dioxide (NO_2) impacts at ecological and human receiver locations. The updated Air Dispersion Modelling and Air Quality Impact Assessment Report has considered the material submitted within the Transboundary Representations, and has responded accordingly including an update of the relevant material in light of updated fuel and explosive volumes and type, and analysis of the updated assessment results in terms of NI Air Quality Standards and limit values and the Northern Ireland Environment Agency (NIEA) *Revised Operational Protocol for assessing ammonia and air pollution impacts on the natural environment* (issued 28th February 2025).

1.3 Dalradian Gold Ltd (DGL, the Applicant) has reviewed the Transboundary consultation comments and can broadly categorise them as follows:

- New issues raised to the Inquiry.
- Repetition of previously issued raised and already addressed by evidence submitted to the Inquiry; and
- Repetition of previously raised issues but using different evidence, opinion or context.

1.4 This response to the information contained within Transboundary Representations (TRs) and the updated Air Dispersion Modelling and Air Quality Impact Assessment Report outlines the potential air quality impacts arising from the proposed Curraghinalt Gold Mine Project and is structured as follows;

Section 1: Introduction.

Section 2: Identification of and response to the technical issues raised in the Transboundary consultation that relate to potential air quality impact.

Section 3: Updated air quality impact assessment, including revised air quality impact assessment results in light of updated fuel and explosive volumes and type, and analysis of updated assessment results in terms of NI Air Quality Standards and limit values and the Northern Ireland Environment Agency (NIEA) *Revised Operational Protocol for assessing ammonia and air pollution impacts on the natural environment* (issued 28th February 2025).

Section 4: Conclusions.

2 Response to the technical issues raised in the Transboundary consultation

1.5 The Transboundary Representations (TRs) prepared by parties located in the Republic of Ireland (RoI) and in Northern Ireland (NI) in relation to the potential air quality impact of the proposed Curraghinalt Gold Mine Project are listed below for ease of reference:

- An Taisce
- Environmental Justice Network Ireland
- Cllr [redacted]
- Loughs Agency
- Friends of the Earth Northern Ireland
- RABHARTA
- [redacted] Farm
- Raphoe JPIC Committee Letterkenny
- Save our Sperrins
- Ecojustice Ireland
- Jesuit Centre for Faith & Justice
- Rights of Nature Donegal
- Centre for Global Education
- Ireland's Think-tank for Action on Social Change
- Save Inis Eoghain
- Objection Sample letter
- Various individual objections.

1.6 An individual response to each Transboundary Representations (TRs) in relation to the potential air quality impact is included in Appendix A.

1.7 In terms of transboundary air quality impacts, various transboundary representations broadly state that there is the potential for air quality contaminants to blow across the north-west of the island and impact on human and ecological receptors in Donegal and beyond. Various assertions are made that 'worst-case scenario' modelling has not been undertaken to calculate, and therefore allow for mitigation of the risks of air pollution from the project. This is not the case. Detailed air dispersion modelling has been undertaken in accordance with best practice and using actual meteorological and topographical data as outlined in detail in the air quality impact assessments and rebuttals to date.

1.8 Various transboundary representations state that tiny particle sizes will lead to dispersion of dust for many miles across NI and RoI. Reference has been made to mines in Finland where fine particles ($PM_{2.5}$) have blown 60 Km from source. As reported in the air quality impact assessments and rebuttals to date, dust dispersion will be limited because the tailings will have a water content of approx. 13%. The use of a water bowser with a modest amount of water spreading will also control windblown dusts and the extent of the local rainfall

volumes and in excess of 100 days per annum with significant rainfall (≥0.2mm) will allow for adequate dust control. The dust dispersion modelling undertaken to date has been based on the relevant Dry Stack Facility (DSF) particle size and content assay. The particle size assay shows relatively large particle sizes with only a very trace level of $PM_{2.5}$ particles (<1%) and PM_{10} particles (<1%) in the dry stack. Therefore, it is accepted that larger particles deposit in close proximity to source, i.e. the DSF, and therefore, there will be little or no dispersion of $PM_{2.5}$ or PM_{10} particles from the dry stack. An assessment of potential heavy metal (potentially toxic elements (PTEs)) impacts from the dry stack has also been undertaken with no significant impact predicted.

1.9 *Rabharta* has queried if "*nitrate and ammonia contamination has been assessed*". An updated air dispersion modelling assessment has been prepared in accordance with the recently published methodology outlined in the NIEA *Revised Operational Protocol for assessing ammonia and air pollution impacts on the natural environment* (issued 28th February 2025). This updated assessment has been based on updated fuel and explosive volumes and type to be used during the life of mine, as provided to AONA Environmental. The mine will not be a source of ammonia emissions. Agriculture is the main source of ammonia levels in Northern Ireland, with 97% of emissions, primarily from animal manures and fertilizers emissions in agriculture. All of NIs designated sites currently exceed critical levels of ammonia and the NI government has set a goal to reduce agricultural ammonia emissions by 30% by 2030.

1.10 Wild Ireland Defence and others have stated that "*Dalradian has applied to use 3.5 million litres of diesel on site every year for the duration of the mine - the pollution potential of this has not been adequately measured in their EIA*". Various references to different volumes of diesel use are quoted in the rebuttals received to date.

1.11 The revised and updated fuel use volumes and type to be used during the life of mine (L.O.M.) indicate the following;

- Annual Average Fuel Use = 1,717,175 l/yr during L.O.M. (Diesel of HVO)
- Annual Peak Fuel Use =2,143,407 l/yr during L.O.M. (Diesel of HVO)

[Note: Updated fuel use data provided by JDS. HVO, or Hydrotreated Vegetable Oil, is a fossil-free biofuel that directly replaces diesel without engine modifications. It is made from waste vegetable oils and animal fats, and can reduce carbon emissions by up to 90% and nitrogen oxide emissions by up to 30% compared to conventional diesel].

1.12 *Save our Sperrins* has stated that there will be *"Use of explosives twice daily for 25 years for 900m deep mine. Explosives relate to ammonium nitrate which is poisonous to humans and the environment."*

1.13 The revised and updated explosive volumes and type to be used during the life of mine (L.O.M.) indicate the following;

- Total Explosives Use = 44,035 tonnes during L.O.M.

[Note: Updated explosives use data provided by DGL. Proposed use of 'Aqueous gels', Emulsion (water resistant emulsion) which emits ~40 times less nitrogen oxides (NOx) / tonne than 'Slurry', ANFO (Ammonium nitrate/fuel oil mix) (ref. NPI)]

Proximity of the proposed Curraghinalt Gold Mine Project Site to the Republic of Ireland

1.14 Various transboundary representations received to date assert that transboundary impacts will occur in Co. Donegal and beyond. The nearest Grid Ref. in the Republic of Ireland is 230042, 388884. This location is 29.1 Km (18 miles) directly west of the proposed Curraghinalt Gold Mine Project site (See Figure 1).

1.15 Figure 2: Ireland Wind Roses (1991 to 2020) indicates the prevailing wind direction and wind speed data across Ireland and outlines that there is a prevailing south-west to westerly wind direction across the island of Ireland.

1.16 Figure 3: Windrose for Aldergrove (Belfast International) Airport & Eglinton (City of Derry) Airport indicates the prevailing wind direction and wind speed data at Aldergrove Airport and outlines that there is a prevailing south-west to westerly wind direction across Northern Ireland.

1.17 Figures 2 & 3 clearly indicate the predominant west-south-westerly wind direction, which shows that the prevailing wind direction in the area of the proposed Curraghinalt Gold Mine Project site will not have the potential to blow towards Co. Donegal or the Republic of Ireland for in excess of 75% - 80% of the time.

Figure 1: Location of the proposed Curraghinalt Gold Mine Project site relative to the RoI border.

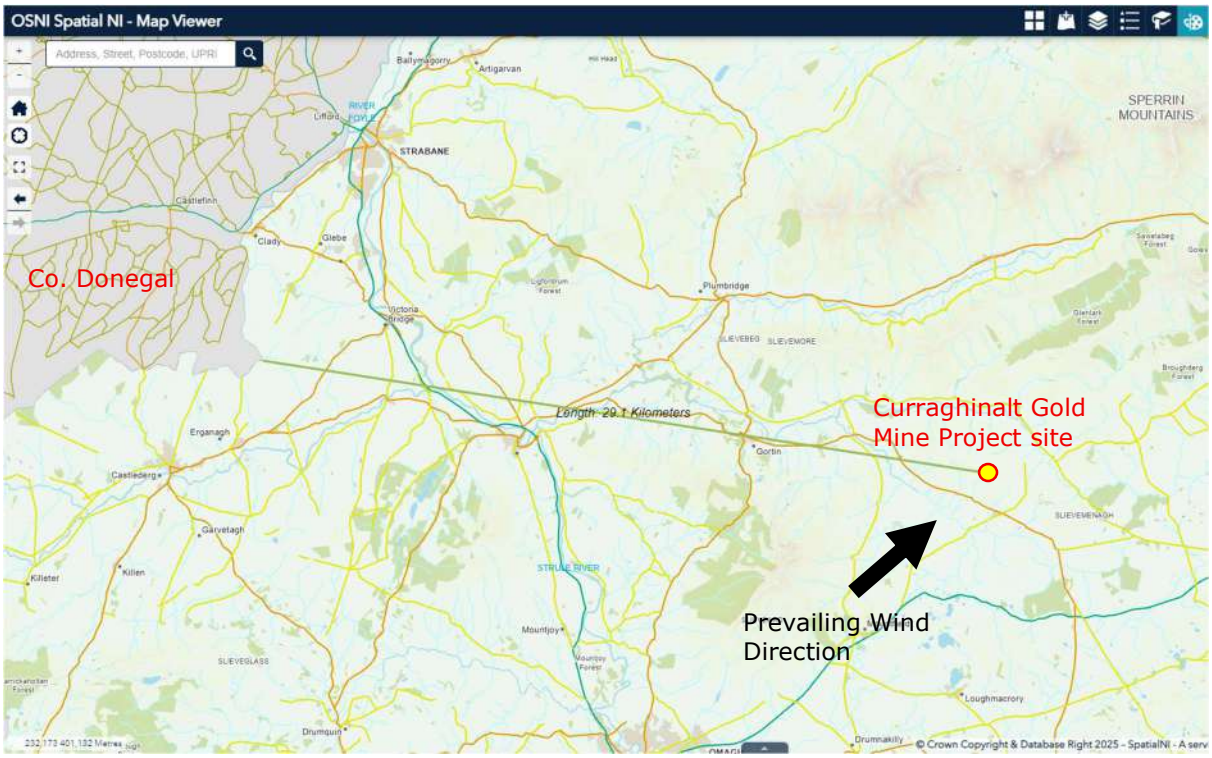


Figure 2: Ireland Wind Roses (1991 to 2020)

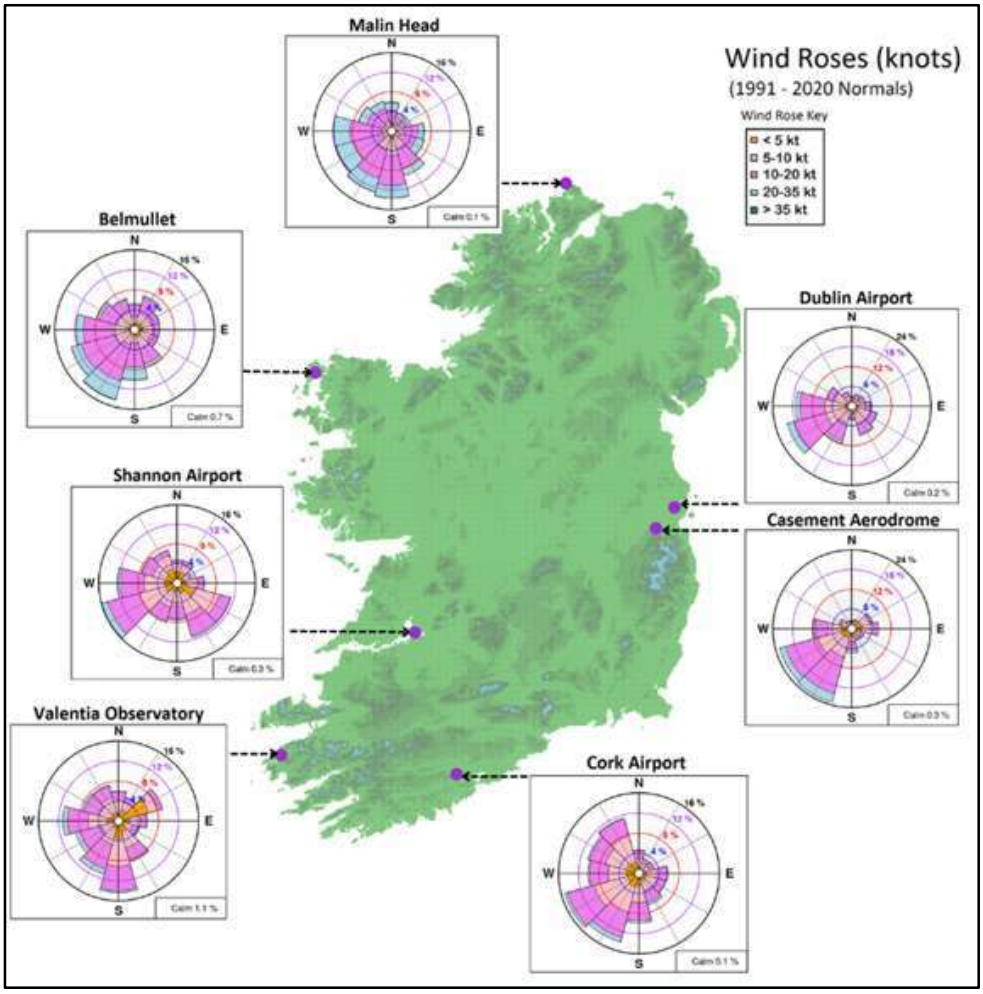
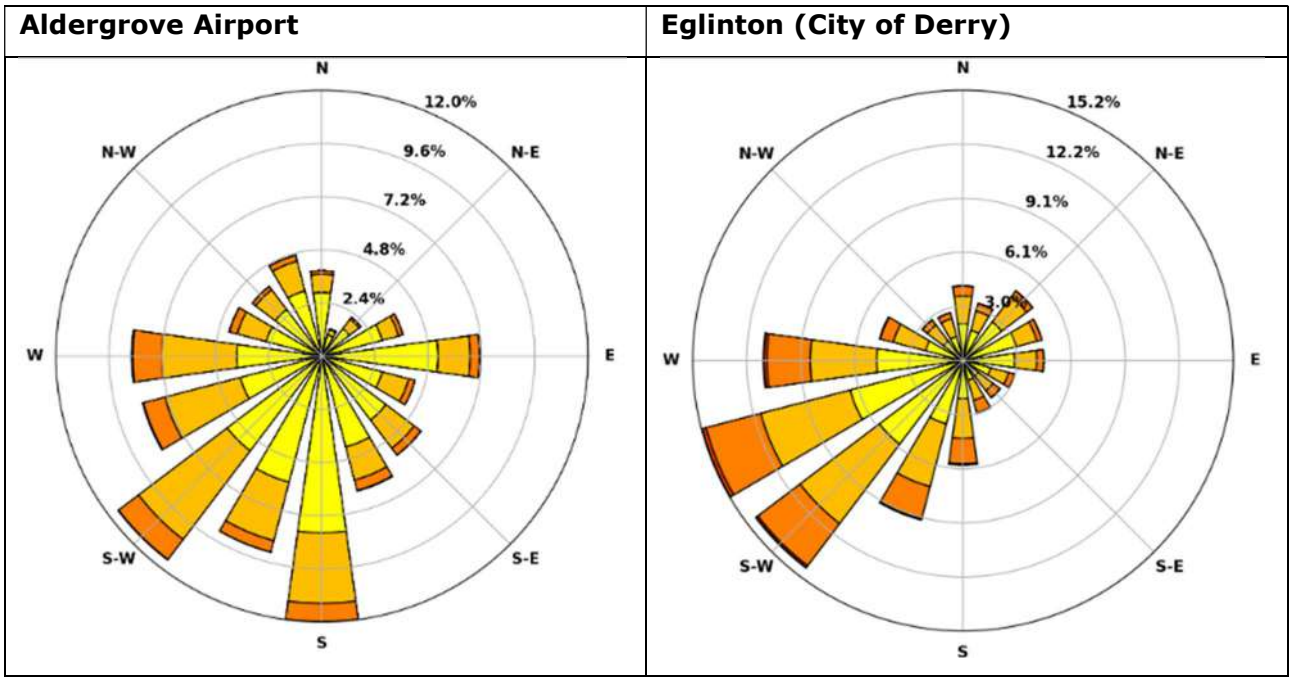


Figure 3: Windrose for Aldergrove (Belfast International) Airport & Eglinton (City of Derry) Airport (5-year Met Data).



3 Updated Air Quality Impact Assessment

Introduction

1.18 DGL has responded to all of the issues related to Air Quality raised in the Transboundary representations within this report.

1.19 The main issues that relate to potential air pollutant emissions in terms of transboundary impacts are the fuel use and underground explosives volumes and type during the life of mine.

1.20 Hence, AONA Environmental has provided updated technical information based on relevant information that has become available since the submission of the previous air quality impact assessments, the ES, TR12 and RR12. Where appropriate, the Air Quality Impact Assessment of the project due to nitrogen oxide emissions which has been presented for consideration is updated.

1.21 Further relevant updated technical information has recently been made available to AONA Environmental since the submission of the TR12 and RR12 for the following;

a) Clarification of the fuel use volumes during the life of mine, including annual average and peak annual usage of both diesel and Hydrotreated Vegetable Oil (HVO) fuel options (fuel use volume information provided to AONA Environmental by JDS in November 2025)

b) Clarification of the type and volume of explosives to be used during the life of mine (provided to AONA Environmental by DGL in October 2025)

c) Publication of the Northern Ireland Environment Agency (NIEA) *Revised Operational Protocol for assessing ammonia and air pollution impacts on the natural environment* (28th February 2025).

1.22 In summary, the updated Air Dispersion Modelling and Air Quality Impact Assessment includes a detailed assessment of the predicted impacts from total project site emissions including nitrogen oxides (NOx) and nitrogen deposition at all designated habitats located within 15 km of the site and nitrogen dioxide (NO_2) impacts at 54 representative human receptor locations in closest proximity to the site.

1.23 The updated Air Dispersion Modelling and Air Quality Impact Assessment includes a detailed assessment of the predicted impacts of nitrogen oxides (NOx) and nitrogen dioxide (NO_2) emissions from total site emissions at the closest location in the Republic of Ireland which is 29.1 Km directly west of the site at Irish Grid Reference – 230042, 388884.

1.24 In order to determine the potential impact on air quality arising from the proposed Curraghinalt Gold Mine Project, the updated air dispersion modelling assessment has been prepared in accordance with the methodology outlined in the NIEA *Revised Operational Protocol for assessing ammonia and air pollution impacts on the natural environment* (issued 28th February 2025).

1.25 A detailed updated air quality assessment of nitrogen oxides (NOx) and nitrogen dioxide (NO_2) has been undertaken to support the application and considers the potential impact of emissions from the proposed Curraghinalt Gold Mine Project based on the clarification of the

fuel use volumes and the type and volume and type of explosives to be used during the life of mine.

1.26 The objective of the atmospheric dispersion modelling exercise is to assess the potential impact on local air quality of process emissions from the proposed Curraghinalt Gold Mine Project, in terms of ground level concentrations of pollutants outlined in the UK Air Quality Regulations and Northern Ireland Environment Agency / DEFRA Environmental Assessment Levels, including Critical Loads and Levels at ecologically designated habitats.

1.27 The updated assessment of impact at designated sites has been undertaken in conjunction with the Project Ecologist.

1.28 This report describes the data used in the modelling, the methodology adopted, assumptions made and the results generated by the model. The predicted pollutant emissions from the proposed Curraghinalt Gold Mine Project are based on information supplied by DGL and JDS to AONA Environmental Consulting Ltd.

Air Dispersion Modelling Methodology

1.29 The updated dispersion modeling has been undertaken using *AERMOD* modeling software, to assess the proposed fuel use volume, fuel type and explosive type and volume on the Curraghinalt Project as per the methodology used in the 2017 Air Quality & Dust Impact Assessment, the Air Quality & Dust Impact Assessment 2019 Addendum and the 2020 Addendum to assess the amendments to the design of the proposed dry stack on the Curraghinalt Project.

1.30 The air dispersion modelling assessment has been prepared in accordance with the methodology outlined in the following reference documentation;

- A guide for planners and developers Local Air Quality Management Technical Guidance LAQM.TG(22) (Last updated May 2025).
- https://www.gov.uk/guidance/environmental-permitting-air-dispersion-modelling-reports

  From: Environment Agency and Department for Environment, Food & Rural Affairs (Last updated March 2024).
- https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#environmental-standards-for-air-emissions - Guidance Air emissions risk assessment for your environmental permit. How to complete an air emissions risk assessment, including how to calculate the impact of your emissions and the standards you must meet.
- Environmental Protection Agency, Ireland, Office of Environmental Enforcement (OEE), Air Dispersion Modelling from Industrial Installations, Guidance Note (AG4) (2020).

1.31 The dispersion model results have been compared against the relevant limits outlined in the following;

- Air Quality Standards 2010

- Environment Agency / DEFRA Environmental Assessment Levels (Last updated March 2025).
- NIEA Revised Operational Protocol for assessing ammonia and air pollution impacts on the natural environment (issued 28th February 2025).

1.32 In order to determine the potential impact on air quality arising from the proposed Curraghinalt Gold Mine Project, a suitable and appropriate detailed air dispersion model (Aermod) has been used. Estimates of atmospheric dispersion and the resultant downwind concentrations of pollutants may be predicted through the use of mathematical models to assess the impacts from airborne releases based on the following parameters;

- Source emission characteristics including emission rate of pollutant, velocity of discharge, height of discharge and temperature of the release,
- Prevailing atmospheric conditions including wind speed, direction, cloud cover, precipitation, ambient temperature and the depth of the mixing layer, and
- Topography and local surface conditions.

1.33 The location of the proposed Curraghinalt Gold Mine Project and immediately adjacent buildings has been extracted from drawings provided to AONA Environmental Consulting Ltd., OSNI Mapping and imported accordingly within the air dispersion model. Accurate building heights have been entered into the model.

1.34 In order to model the emissions, data is required in relation to the emission point location, stack height and diameter, exit velocity and / or volume flow rate, temperature and pollutant emission rate in grams per second.

1.35 The worst-case air dispersion model outputs are based upon 8,760 hours of operation of the proposed Curraghinalt Gold Mine Project in a year, i.e. assumed continuous operations at calculated emission concentrations and rates.

1.36 The time averaging and percentiles have been calculated in terms of the pollutant concentration limit values criteria detailed in the air quality standards. For example, the time averaging and percentiles have been calculated in terms of the concentration limit values criteria detailed in the relevant Air Quality Standard limits. For example, nitrogen dioxide has been calculated as a 99.79th percentile of 1-hour concentrations and annual mean concentrations.

1.37 Hourly sequential meteorological data from Aldergrove Airport for the year 2015 was used in the air dispersion model, i.e. the worst-case year of met data that was determined in the 2017 ES in accordance with relevant guidance.

Nitrogen Oxide (NOx) Emissions

1.38 The emission rates input into the *AERMOD* dispersion models for the proposed Curraghinalt Gold Mine Project sources are outlined in Tables 1 - 4.

1.39 The calculated nitrogen oxides (NOx) and nitrogen dioxide (NO_2) emission rates are based on the clarification of the fuel use volumes during the life of mine, including annual average

and peak annual usage of both diesel and HVO fuel options, and a clarification of the volume and type of explosives to be used during the life of mine.

1.40 The updated air dispersion models have been run for the following four scenarios. The air dispersion models include nitrogen oxides (NOx) and nitrogen dioxide (NO_2) emissions from Underground Mining sources (via the new vent raise and portal emissions, incl. transport and explosives), Surface Support Equipment, TSF Management and Process Plant emissions.

- Scenario 1 - Life of Mine Average of 1,717,175 million litres of diesel / annum
- Scenario 2 - Life of Mine Average of 1,717,175 million litres of HVO / annum
- Scenario 3 - Annual Peak of 2,143,407 million litres of diesel / annum
- Scenario 4 - Annual Peak of 2,143,407 million litres of HVO / annum

1.41 In terms of NOx from underground explosives use, DGL has advised AONA Environmental that there will be 44,035 tonnes of Aqueous gels, Emulsion (water gel slurry)) explosives used during life of mine.

Table 1: NOx Emissions from Explosives.

The quantity of Nitrogen Oxide (NOx) from Explosives depends on the type of explosive to be used [Note 1]; • 'Slurry', ANFO (Ammonium nitrate/fuel oil mix) = 8 kg NOx / tonne ANFO (ref. AP42 & NPI) • 'Slurry', ANFO heavy (mix with emulsion) = 3.8 kg NOx / tonne emulsified ANFO (ref. NPI) • 'Aqueous gels', Emulsion (water resistant emulsion) = 0.2 kg NOx / tonne emulsion (ref. NPI) [Subtek Velcro is the product that DGL will be using and it is a water-based emulsion]
• In the exploration mine, DGL was primarily using 'Slurry', ANFO (Ammonium nitrate/fuel oil mix) => 8 kg NOx / tonne ANFO (ref. AP42 & NPI) • DGL propose to use 'Aqueous gels', Emulsion (water gel slurry) => 0.2 kg NOx / tonne emulsion (ref. NPI) • Therefore, if DGL use Aqueous gels, Emulsion (water gel slurry)) explosives then NOx emissions are ~40 times lower NOx emissions from blasting than was assessed in the 2019 addendum.

Note 1: The relevant reference documents include AP42 13.3 Explosives Detonation - Chapter 13.3, Table 13.3.1 and National Pollutant Inventory (NPI), Emission estimation technique manual for Explosives detonation and firing ranges [Version 3.1, August 2016].

Table 2: NOx Emission Rate from Explosives use (Explosive volumes advised to AONA Environmental in October 2025 & based on 0.2 kg Nitrogen Oxide / tonne emulsion).

NOx Emission Source	**Total (Life of Mine)**	**Unit**
Explosive type - 'Aqueous gels', Emulsion (water gel slurry)	44,035	tonne
	8,807	NOx Kg/annum
	8,806,976	NOx g/annum
Average NOx Emission Rate – Life of Mine from explosive use.	**0.0109**	**NOx g/s**

1.42 In terms of NOx from Fuel Use, JDS has advised AONA Environmental that there will be annual average fuel use across the Life of Mine Average of 1,717,175 million litres of diesel

or HVO annum and an annual peak fuel use across the Life of Mine Average of 2,143,407 million litres of diesel or HVO annum.

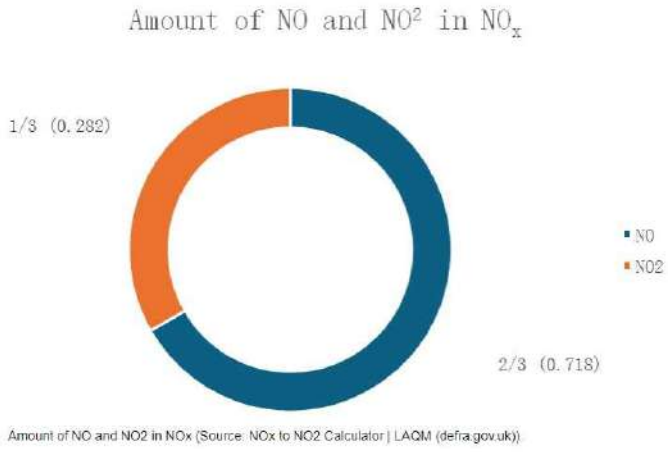
1.43 JDS has calculated the annual average fuel use across the Life of Mine and derived the following NOx emission rates from various sources on site.

1.44 JDS has derived NOx generation from diesel use as 0.4 g/kWhr and from HVO use as 0.28 g/kWhr.

Table 3: NOx Emission Rates from Fuel use (as advised to AONA Environmental in November 2025 by JDS)

Project Sector	LOM Average Fuel Use (million L/yr)	Annual Average NOx (g/s)	Peak Annual Fuel Use (million L/yr)	Peak Annual NOx (g/s)
Underground Mining	1.72	0.0633	2.14	0.0770
Surface Support Equipment	0.24	0.0311	0.24	0.0311
TSF Management	0.17	0.0210	0.17	0.0210
Process Plant	0.07	0.0037	0.07	0.0037
Total	**2.23**	**0.1192**	**2.66**	**0.1329**

1.45 With reference to the LAQM(22) guidance, the amount of NO_2 in total NO_X has been derived from 0.718 NO : 0.282 NO_2 ratio reported by DEFRA (Source: NOx to NO_2 Calculator).



Amount of NO and NO2 in NOx (Source: NOx to NO2 Calculator | LAQM (defra.gov.uk))

1.46 The dispersion modeling has assessed a proposed 60:40 split for Vent Raise & Portal emissions of the Underground Mining emissions. This in accordance with the current ventilation design for the mine.

1.47 The Underground Mining and Process Plant emissions have been modelled as a 'point source'. The ventilation raise and portal locations remain unchanged from the Addendum submitted in mid-2019.

1.48 The Surface Support Equipment and the TSF Management have been modelled as a 'line source'.

Table 4: Calculated NOx & derived NO_2 Emission Rates from Fuel & Explosives use from the various sources on site.

Plant & Equipment Emissions Source	**NOx & derived NO_2 Emission Rates - Life of Mine Average Fuel Use of 1,717,175 million litres / annum**			
	Diesel		**HVO**	
	NOx g/s	**NO_2 g/s**	**NOx g/s**	**NO_2 g/s**
New Exhaust Vent Raise	0.0445	0.0125	0.0331	0.0093
New Portal	0.0297	0.0084	0.0221	0.0062
Process Plant Emissions	0.0037	0.0010	0.0026	0.0007
Surface Support Equipment	0.0311	0.0088	0.0218	0.0061
TSF Management	0.0210	0.0059	0.0147	0.0042
Plant & Equipment Emissions Source	**NOx & derived NO_2 Emission Rates - Annual Peak Fuel Use of 2,143,407 million litres / annum**			
	Diesel		**HVO**	
	NOx g/s	**NO_2 g/s**	**NOx g/s**	**NO_2 g/s**
New Exhaust Vent Raise	0.0527	0.0149	0.0389	0.0110
New Portal	0.0351	0.0099	0.0259	0.0073
Process Plant Emissions	0.0037	0.0010	0.0026	0.0007
Surface Support Equipment	0.0311	0.0088	0.0218	0.0061
TSF Management	0.0210	0.0059	0.0147	0.0042

Note; Diesel NOx generation = 0.4 g/kWh & HVO NOx generation = 0.28 g/kWh

Dry Stack & Expected Workings

1.49 The previously submitted assessment of the dust impact including dust deposition and particulate (PM_{10} & $PM_{2.5}$) emissions from the proposed DSF design remains unchanged.

1.50 As stated in the Addendum submitted in mid-2019, the introduction of the conveyor system has very significantly reduced the volume of vehicle movements on the site on paved and unpaved roads and the prediction of fugitive dust emission rates from the site was subsequently updated.

1.51 The Construction Sequence prepared by SRK Consulting advised the updated dust modelling assumptions. For the 2020 Addendum amendments to the design of the proposed dry stack on the Curraghinalt Project, SRK Consulting advised AONA Environmental of the tonnages of waste rock and tailings that will be sent to the construction of the 'starter embankment' as well as the infill of Cells 1, 2 and 3 in the DSF.

1.52 As a worst-case scenario, the year of operation with the highest volume of waste rock and tailings to be distributed to the DSF was selected for assessment in the dust dispersion models.

Human Receptors Locations:

1.53 The AERMOD model has been used to calculate ground level pollutant concentrations at specific human receptors locations in the vicinity of the proposed DGL site.

1.54 Ground level pollutant concentrations were predicted at a selection of the nearest residential properties in proximity to the site as shown Table 5.

1.55 Ground level pollutant concentrations were also predicted at every node on a series Cartesian grids around proposed DGL site. This has allowed for the production of concentration isopleths as outputs from the Aermod models.

Table 5: Location of representative residential receptors in proximity to the DGL site.

AQSR Ref.	Address	Receptor ID	Irish Grid X (m)	Irish Grid Y (m)
AQSR 1	184 Crockanboy Road	D-R-0037	256761	384008
AQSR 2	191 Crockanboy Road	D-R-0020	256854	383777
AQSR 3	186 Crockanboy Road	D-R-0024	256882	383964
AQSR 4	193 Crockanboy Road	D-R-0013	256968	383724
AQSR 5	200 Crockanboy Road	D-R-0047	257416	383735
AQSR 6	184 Crockanboy Road	D-R-0048	257405	384171
AQSR 7	204 Crockanboy Road	D-R-0010	257526	383946
AQSR 8	210 Crockanboy Road	D-R-0028	257590	383745
AQSR 9	207 Crockanboy Road	D-R-0045	257618	383587
AQSR 10	213 Crockanboy Road	D-R-0041	257757	383496
AQSR 11	212 Crockanboy Road	D-R-0053	257838	383618
AQSR 12	216 Crockanboy Road	D-R-0030	257967	383908
AQSR 13	225 Crockanboy Road	D-R-0051	258006	383439
AQSR 14	231 Crockanboy Road	D-R-0050	258311	383302
AQSR 15	234 Crockanboy Road	D-R-0054	258758	383565
AQSR 16	238 Crockanboy Road	D-R-0036	258757	383419
AQSR 17	244 Crockanboy Road	D-R-0043	258827	383380
AQSR 18	256 Crockanboy Road	D-R-0009	258764	383126
AQSR 19	254 Crockanboy Road	D-R-0016	259035	383315
AQSR 20	260 Crockanboy Road	D-R-0044	259153	383250
AQSR 21	268 Crockanboy Road	D-R-0022	259256	383030
AQSR 22	264 Crockanboy Road	D-R-0018	259267	383256
AQSR 23	56 Mullydoo Road	D-R-0133	259408	383968
AQSR 24	276 Crockanboy Road	D-R-0011	259505	383026
AQSR 25	146 Greencastle Road	D-R-0064	259658	382925
AQSR 26	164 Greencastle Road (Presbytery)	D-R-0565	260006	383014
AQSR 27	170 Greencastle Road	D-R-0550	260260	383304
AQSR 28	172 Greencastle Road	D-R-0566	260380	383538
AQSR 29	46 Mullydoo Road	D-R-0684	260431	383554
AQSR 30	188 Greencastle Road	D-R-0072	260444	384136
AQSR 31	198 Greencastle Road	D-R-0076	260281	384515
AQSR 32	200 Greencastle Road	D-R-0070	260401	384619
AQSR 33	204 Greencastle Road	D-R-0071	260351	384848
AQSR 34	208 Greencastle Road	D-R-0073	260179	385082
AQSR 35	216 Greencastle Road	D-R-0062	260072	385233
AQSR 36	K/2012/0141/RM Adjacent to 208 Crockanboy Road	D-Prop-0031	257400	384225
AQSR 37	St Patrick's GFC	D-NR-0043	260322	383649
AQSR 38	Greencastle Amateur Boxing Club	D-NR-0044	260371	383622
AQSR 39	Greencastle Community Association	D-NR-0045	260346	383637
AQSR 40	St Patrick's Church, Sheskinshule	D-NR-0046	260145	383153
AQSR 41	Green Elves Nursery School	D-NR-0048	259345	382813
AQSR 42	Greencastle School	School	259340	382820
AQSR 43	35 Camcosy Road	D-R-0269	256240	386548

AQSR 44	34 Camcosy Road	D-R-0291	256284	386594
AQSR 45	Camcosy Road	D-R-0280	256707	386970
AQSR 46	45 Camcosy Road	D-R-0290	257257	386686
AQSR 47	49 Camcosy Road	D-R-0286	257427	386718
AQSR 48	48 Camcosy Road	D-R-0275	257494	386773
AQSR 49	Camcosy Road	D-R-0298	257759	386767
AQSR 50	54 Camcosy Road	D-R-0270	257905	386809
AQSR 51	57 Camcosy Road	D-R-0289	258160	386632
AQSR 52	59 Camcosy Road	D-R-0283	258644	386398
AQSR 53	Camcosy Road	D-R-0172	258760	386367
AQSR 54	63 Camcosy Road	D-R-0281	258968	386341

Assessment of Significance of Potential Environmental Effects

1.56 In terms of the 'Significance of Potential Environmental Effects' the magnitude (scale of change) has been determined by considering the impacts of the proposed DGL site on air quality with reference to the baseline conditions and environmental assessment criteria.

1.57 The rationale for describing the impact of the proposed DGL site is derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017).

1.58 There is a two-stage process to be followed in the assessment of air quality impacts.

- a qualitative or quantitative description of the impacts on local air quality arising from the proposed development; and
- a judgement on the overall significance of the effects of any impacts

1.59 The suggested framework for describing the impacts is set out in Table 6.3 of the EPUK & IAQM guidance document and is shown in Table 6. The term Air Quality Assessment Level (AQAL) has been adopted as it covers all pollutants, i.e. those with and without formal standards. AQAL is used to include air quality objectives or limit values where these exist. The Environment Agency uses a threshold criterion of 10% of the short term AQAL as a screening criterion for the maximum short-term impact. The EPUK & IAQM guidance adopts this as a basis for defining an impact that is sufficiently small in magnitude to be regarded as having an insignificant effect.

Table 6: Impact descriptors for individual receptors

Long term average Concentration at Receptor in assessment year	**% Change in concentration relative to Air Quality Assessment Level (AQAL)**			
	1	**2-5**	**6-10**	**>10**
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Moderate
103-109% f AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial
Explanation 1. AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.				

2. The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5% will be described as Negligible.

3. The Table is only designed to be used with annual mean concentrations.

4. Descriptors for individual Receptors only; the overall significance is determined using professional judgement (see Chapter 7). For example, a 'moderate' adverse impact at one Receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.

5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase.

6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.

7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

1.60 The rationale for the assessment of significance is derived from the EPUK & IAQM Guidance (paragraphs 7.1-7.12 referring to Table 6.3) and relates to Table 6 above.

1.61 Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as 'significant' or 'not significant'. An 'impact' is the change in the concentration of an air pollutant, as experienced by a Receptor. This may have an 'effect' on the health of a human Receptor, depending on the severity of the impact and other factors that may need to be taken into account. The impact descriptors set out in Table 6 are not, of themselves, a clear and unambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual Receptors. Whilst it may be that there are 'slight', 'moderate' or 'substantial' impacts at one or more Receptors, the overall effect may not necessarily be judged as being significant in some circumstances.

1.62 Any judgement on the overall significance of effect of the proposed DGL site will need to take into account such factors as:

- the existing and future air quality in the absence of the proposed DGL site;
- the extent of current and future population exposure to the impacts; and
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.
- Other factors may be relevant in individual cases.

Procedure for assessing air pollution impacts on the natural environment

1.63 NIEA has developed a new assessment procedure based on the Decision-Making Threshold (DMT) project commissioned by the Joint Nature Conservation Committee (JNCC) for the assessment of nitrogen-emitting developments. The *'Revised operational protocol for assessing air pollution impacts on the natural environment'*, which includes the new procedure was published on 28th February 2025.

1.64 The DMT project recommends the application of a *De-minimis* threshold which signifies when emissions from a project would be unlikely to act together with other emissions in such a way that would require further, more detailed air pollution impacts assessment. The *De-minimis* threshold is an evidence-based screening threshold.

1.65 The DMT project also recommends the application of a Site Relevant Threshold (SRT) for those developments where a *De-Minimis* threshold is considered too conservative, i.e. where surrounding development pressure is low.

1.66 This assessment procedure provides a legally and scientifically robust approach to undertaking environmental assessments whilst protecting sensitive sites and habitats from the environmental damage attributable to ammonia emissions and nitrogen deposition.

1.67 The outputs from the air dispersion modelling study indicate NOx concentrations at ecological receptor locations in the vicinity of the proposed DGL site.

1.68 The results of the air dispersion modelling study showing the predicted Annual Mean NOx concentrations have been presented as pollutant dispersion isopleths (See Appendix A, Figures A1 – A4), which indicate the dispersion of the process contribution NOx emissions from the proposed DGL site.

Figure 4: Overview of the five step decision and advisory framework.

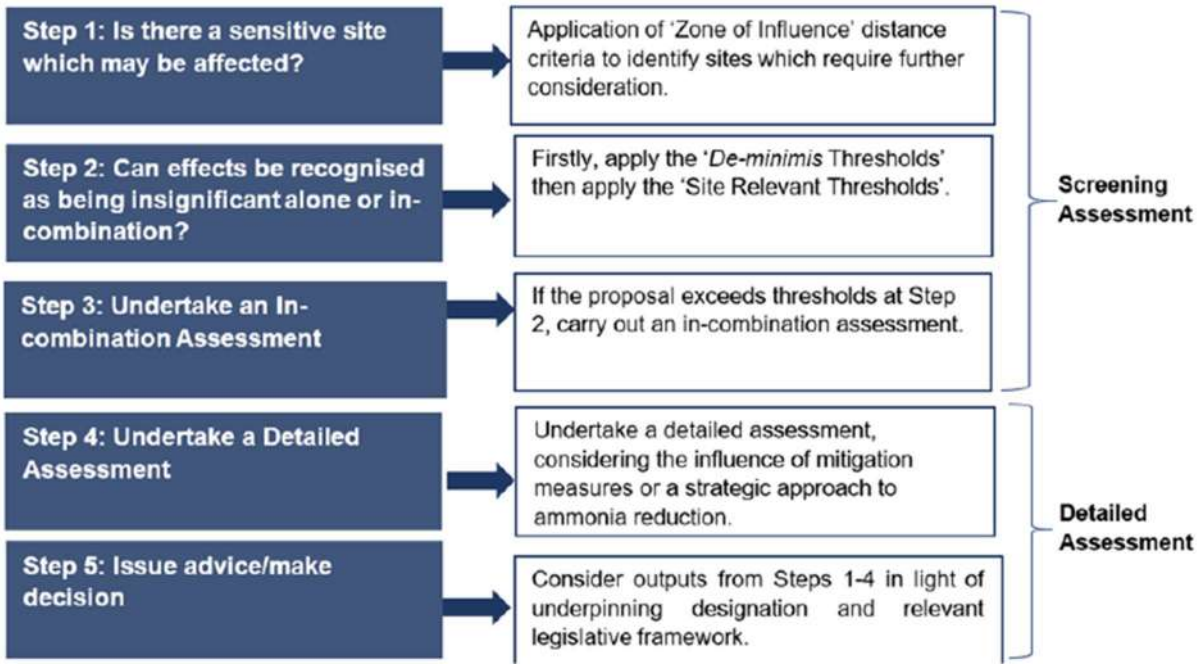
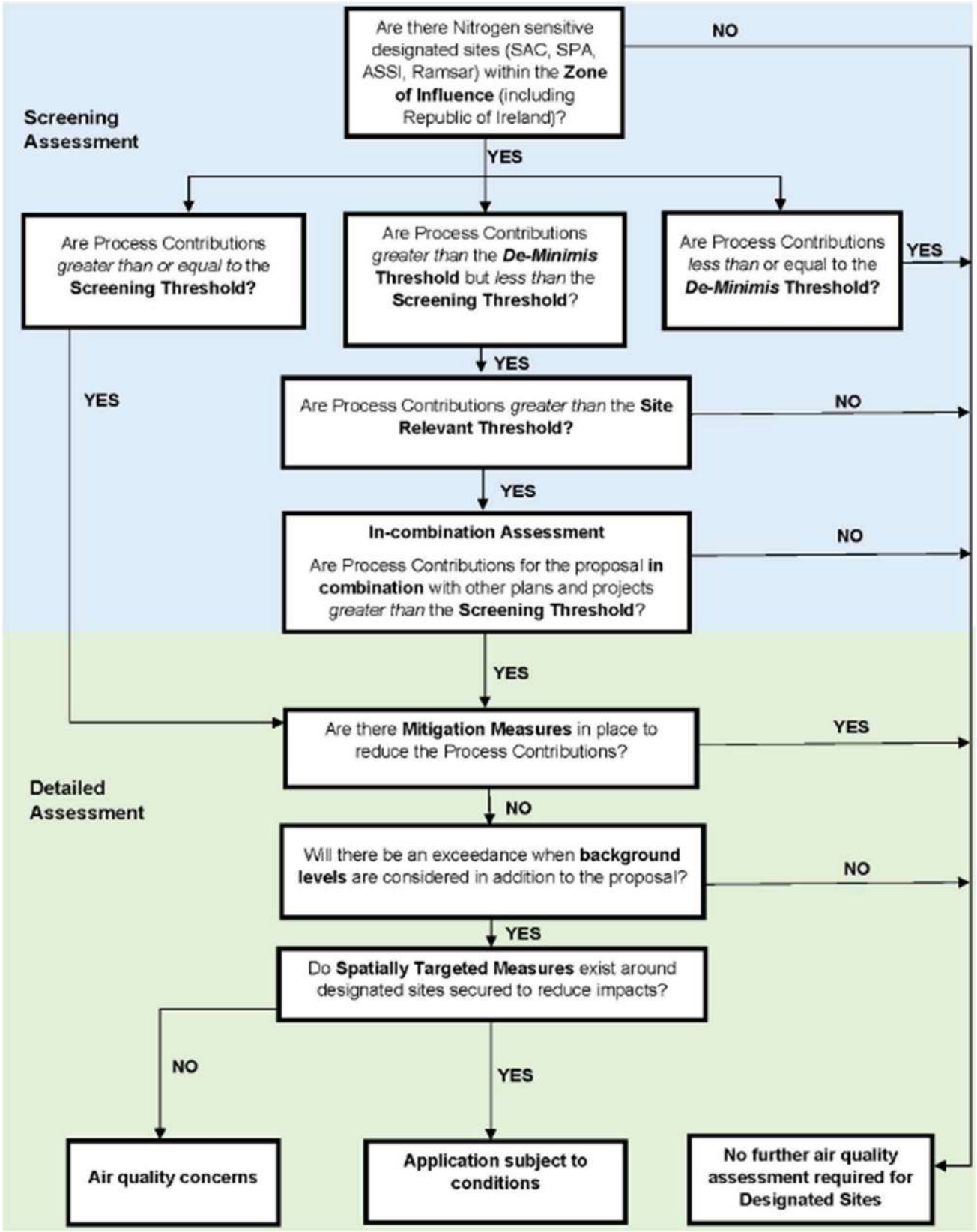


Figure 5: The full flowchart of the Assessment Procedure.



Summary of the 'Revised operational protocol for assessing air pollution impacts on the natural environment';

Screening Assessment;

Step 1: Is there a sensitive site which may be affected?

- Determine the 'Zone of Influence', depending on the type of proposal and identify if any nitrogen sensitive sites are affected. Designated sites to consider:
    - Areas of Special Scientific Interest (ASSIs)
    - Special Areas of Conservation (SACs)
    - Special Protection Areas (SPAs)
    - Ramsar sites

The Air Pollution Information System (APIS) is used to determine the location of the nearest ecologically sensitive sites to the site and to screen the ecologically sensitive sites for further detailed assessment.

Step 2: Can effects be recognised as being insignificant alone or in-combination?

- Apply the *De-minimis* Threshold, which are as follows;
    - 0.08% of the Critical Level for Ammonia.
    - 0.05% of the Critical Level for NOx.
    - 0.09% - 0.13% of the Critical Load for Nitrogen Deposition.
    - If a Process Contribution (PC) is below or equal to the *De-minimis* Threshold, it is screened out of further assessment.
- If any PC exceeds the *De-minimis* Threshold, a *Site Relevant Threshold (SRT)* must be calculated, and the PC of the proposal is then assessed against this. The SRT is used to identify those cases where the *De-minimis* Threshold is deemed too conservative. The SRT takes account of site-specific considerations. SRTs range between 'Very Low' and 'High' and are an estimation of the predicted development density around the proposal between 2017-2030. The SRTs range from:
    - 0.08% - 0.75% of the Critical Level for Ammonia.
    - 0.05% - 0.29% of the Critical Level for NOx.
    - 0.09% - 1.3% of the Critical Load for Nitrogen deposition.
    - If a PC is below or equal to the SRT, it is screened out of further assessment.

[Note: JNCC Report No. 696 Main Report Guidance on Decision-making Thresholds for Air Pollution (2021), *Section 4.2 Site-relevant threshold based on development pressure* outlines the calculation methodology for a Site Relevant Threshold (SRT)]

Step 3: Undertake an In-combination Assessment

- An in-combination assessment (incl. effects from other plans or projects) is required where the PC of the proposal is above the *De-minimis* Threshold and SRT but less than the screening threshold. Screening Thresholds, also known as Test of Likely Significance (ToLS) thresholds are:
    - 1% of the Critical Level for Ammonia.
    - 0.4% of the Critical Level for NOx.
    - 0.8% - 8.5% of the Critical Load for Nitrogen.

- If a PC, in combination with other plans or projects, is below or equal to the Screening Threshold, it is screened out of further assessment.

The Test of Likely Significance Threshold identifies if the plan or project is likely to have a significant effect on the qualifying feature(s) of a protected site, either alone or in-combination with other plans or projects. If there is a potential significant effect, an Appropriate Assessment may be required.

Detailed Assessment;

Step 4: Undertake a Detailed Assessment

- Take account of Mitigation Measures: Mitigation measures may be effective in reducing emissions so that the PC falls below *De-minimis*/SRT/ToLS threshold.
- Take account of Exceedance Levels: Determine the Predicted Environmental Level (PEL), which is the combination of existing background levels of pollutants and the PC of the proposal.
- Take account of Spatially Targeted Measures

Step 5: Issue advice/make decision.

1.69 AONA Environmental has summarised the interpretation of the flowchart of the Assessment Procedure as follows;

- Less than *De-minimis* Threshold, 0.08% of EAL => No further AQ Assessment required.
- Less than Site Relevant Threshold (SRT) 0.29% of EAL => No further AQ Assessment required.
- Less than Screening Threshold (Test of Likely Significance) 0.4% of EAL => No further AQ Assessment required.
- Greater than Screening Threshold (SRT) 0.4% of EAL => Detailed Assessment required & outline mitigation measures to reduce Process Contributions.
- If there are no mitigation measures in place => Need to assess if there will be an exceedance when background levels are considered in addition to the proposal.

1.70 Ecologically designated sites within 15 Km of the DGL site include Special Areas of Conservation (SAC), Special Protection Areas (SPA) & Sites of Special Scientific Interest (SSSI) which have been included in the air dispersion model. The locations of the sensitive ecological receptors considered in the study are outlined in Table 7.

1.71 In accordance with the NIEA procedure, the online SCAIL - Simple Calculation of Atmospheric Impact Limits (ceh.ac.uk) tool, in accordance with APIS, has been used for the purposes of accurately identifying all designated habitats in proximity to the development site as well as determining the relevant background concentrations, deposition rates and the critical loads & levels at these sites.

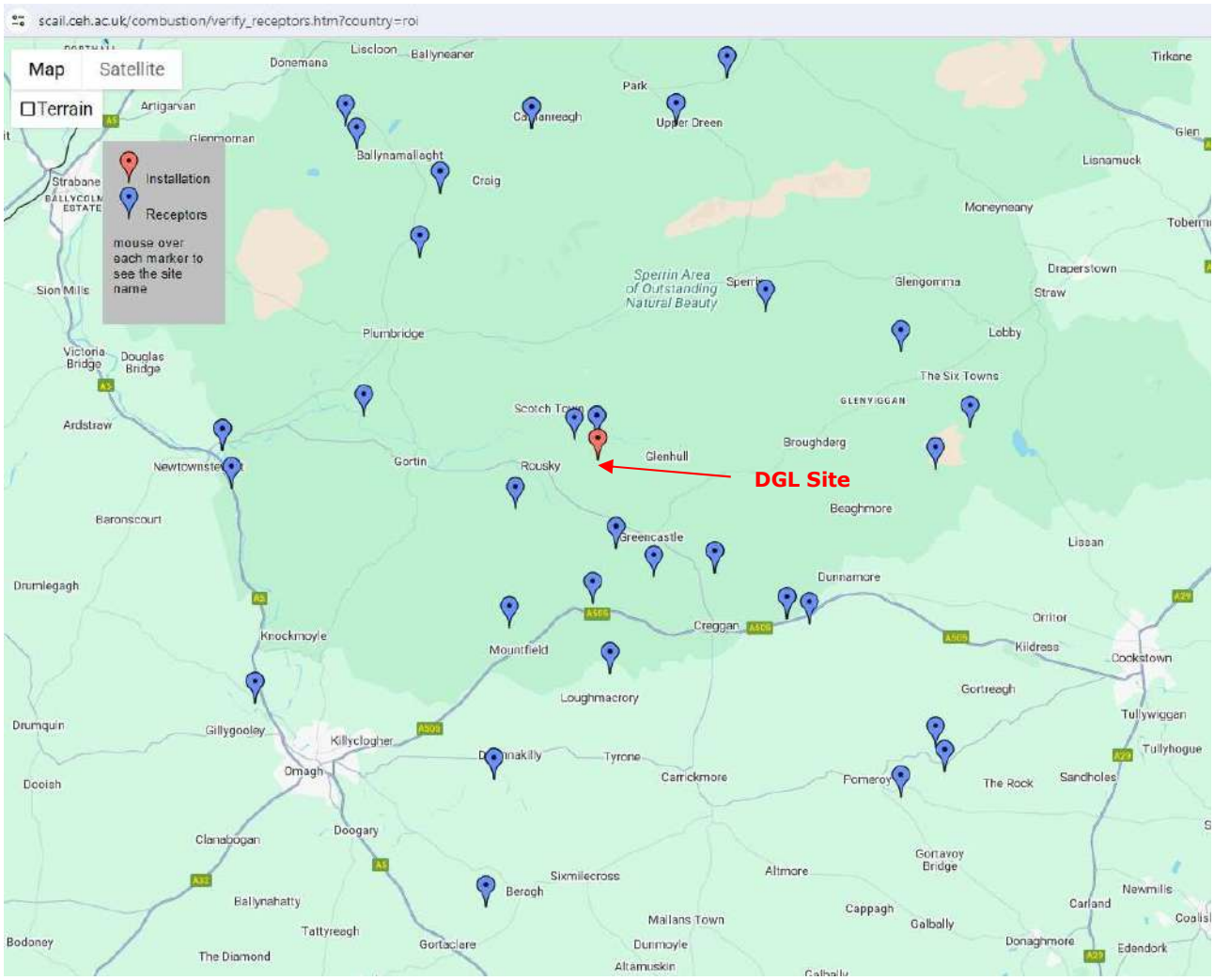
1.72 The relevant background concentrations, deposition rates and the critical loads & levels at these sites have been used from SCAIL to determine the impact of the development using the detailed air dispersion model (Aermod).

1.73 The nearest designated ecologically sensitive receptor, Owenkillew River SAC & ASSI located to the north-west of the proposed DGL site and is of special scientific interest for its bog woodland and oakwood.

Table 7: Ecological receptor sites (ER) within 15 Km of the proposed DGL site.

Ref.	Name	Site Code	Type	Irish Grid Ref.
ECO1	Owenkillew River	UK0030233	SAC	257305_386965
ECO2	Owenkillew River	ASSI213	SSSI	257305_386965
ECO3	Drumlea and Mullan Woods	ASSI056	SSSI	256315_386861
ECO4	Owenreagh River	ASSI396	SSSI	258206_382170
ECO5	Mullaghcarn	ASSI309	SSSI	253785_383809
ECO6	Cashel Rock	ASSI313	SSSI	259826_380964
ECO7	Murrins	ASSI203	SSSI	257180_379740
ECO8	Black Bog	UK0016609	SAC	262522_381142
ECO9	Black Bog	ASSI007	SSSI	262522_381142
ECO10	Mountfield Quarry	ASSI311	SSSI	253564_378635
ECO11	Lough Macrory	ASSI348	SSSI	257985_376715
ECO12	Lough Lark	ASSI407	SSSI	264564_392516
ECO13	Owenkillew and Glenelly Woods	ASSI062	SSSI	247127_387753
ECO14	Upper Ballinderry River	ASSI199	SSSI	265681_379218
ECO15	Upper Ballinderry River	UK0030296	SAC	265681_379218
ECO16	Lough Doo	ASSI226	SSSI	266672_379025
ECO17	Butterlope Glen	ASSI325	SSSI	249509_394657
ECO18	Aghabrack	ASSI304	SSSI	250363_397441
ECO19	Crockaghole Wood	ASSI055	SSSI	270458_390870
ECO20	River Faughan and Tributaries	UK0030361	SAC	254279_400266
ECO21	River Faughan and Tributaries	ASSI296	SSSI	254279_400266
ECO22	Deroran Bog	ASSI035	SSSI	252982_372068
ECO23	Deroran Bog	UK0030324	SAC	252982_372068
ECO24	Teal Lough and Slaghtfreeden Bogs	UK0016608	SSSI	272054_385820

Figure 6: Location of sensitive ecological receptors in proximity to DGL site (within 15 Km).



Predicted Impact at Human Receptors

1.74 The outputs from the air dispersion modelling study indicate ground level NO_2 concentrations at human receptor locations in the vicinity of the proposed DGL site. No background concentrations have been input onto the air dispersion models.

1.75 The results of the predicted Annual Mean and 99.79%ile of 1-Hour NO_2 concentrations at human receptor locations have been compared against the relevant Air Quality Standard limit values for NO_2 (See Table 8 for predicted NO_2 concentrations at all Air Quality Sensitive Receptors).

1.76 The results of the air dispersion modelling study showing the predicted Annual Mean and 99.79%ile of 1-Hour NO_2 concentrations have been presented as pollutant dispersion isopleths (See Appendix A, Figures A5 – A12), which indicate the dispersion of the process contribution Annual Mean and 99.79%ile of 1-Hour NO_2 emissions from the proposed DGL site.

Table 8: Dispersion Modelling Results - Predicted **Annual Mean and 99.79%ile of 1-Hour Nitrogen Dioxide (NO_2)** concentrations ($\mu g/m^3$) from DGL site at the nearest residential receptor locations versus the Air Quality Standards Regulations 2010 limit.

AQSR Ref No.	Address	1.72 M L Diesel / annum		1.72 M L HVO / annum		2.14 M L Diesel / annum		12.14 M L HVO / annum	
		99.79%ile of 1-Hour NO2 Conc $\mu g/m^3$	Annual Mean NO2 Conc $\mu g/m^3$	99.79%ile of 1-Hour NO2 Conc $\mu g/m^3$	Annual Mean NO2 Conc $\mu g/m^3$	99.79%ile of 1-Hour NO2 Conc $\mu g/m^3$	Annual Mean NO2 Conc $\mu g/m^3$	99.79%ile of 1-Hour NO2 Conc $\mu g/m^3$	Annual Mean NO2 Conc $\mu g/m^3$
AQSR 1	184 Crockanboy Road	1.573	0.031	1.111	0.022	1.580	0.032	1.112	0.023
AQSR 2	191 Crockanboy Road	1.503	0.027	1.056	0.019	1.503	0.028	1.060	0.020
AQSR 3	186 Crockanboy Road	1.614	0.032	1.133	0.023	1.703	0.034	1.214	0.024
AQSR 4	193 Crockanboy Road	1.505	0.027	1.063	0.019	1.529	0.028	1.076	0.020
AQSR 5	200 Crockanboy Road	1.648	0.035	1.161	0.025	1.648	0.036	1.168	0.025
AQSR 6	184 Crockanboy Road	2.589	0.056	1.777	0.039	2.573	0.057	1.813	0.040
AQSR 7	204 Crockanboy Road	2.125	0.045	1.496	0.032	2.174	0.046	1.529	0.033
AQSR 8	210 Crockanboy Road	1.925	0.039	1.403	0.028	1.995	0.040	1.403	0.028
AQSR 9	207 Crockanboy Road	1.703	0.032	1.198	0.023	1.703	0.033	1.198	0.023
AQSR 10	213 Crockanboy Road	1.571	0.030	1.128	0.021	1.716	0.031	1.227	0.022
AQSR 11	212 Crockanboy Road	1.884	0.037	1.325	0.026	1.884	0.038	1.330	0.027
AQSR 12	216 Crockanboy Road	2.501	0.063	1.761	0.045	2.572	0.065	1.814	0.046
AQSR 13	225 Crockanboy Road	1.708	0.033	1.203	0.023	1.727	0.034	1.255	0.024
AQSR 14	231 Crockanboy Road	1.819	0.033	1.287	0.023	1.843	0.034	1.292	0.024
AQSR 15	234 Crockanboy Road	2.678	0.060	1.877	0.042	2.704	0.061	1.936	0.044
AQSR 16	238 Crockanboy Road	2.562	0.050	1.810	0.035	2.610	0.052	1.840	0.037
AQSR 17	244 Crockanboy Road	2.515	0.048	1.763	0.034	2.516	0.050	1.788	0.035
AQSR 18	256 Crockanboy Road	2.178	0.036	1.528	0.026	2.203	0.038	1.550	0.027
AQSR 19	254 Crockanboy Road	2.410	0.043	1.696	0.030	2.452	0.044	1.726	0.031
AQSR 20	260 Crockanboy Road	2.160	0.038	1.515	0.027	2.191	0.039	1.551	0.027
AQSR 21	268 Crockanboy Road	1.993	0.030	1.400	0.021	2.022	0.031	1.468	0.022
AQSR 22	264 Crockanboy Road	2.206	0.036	1.548	0.026	2.207	0.037	1.548	0.026
AQSR 23	56 Mullydoo Road	3.525	0.062	2.487	0.046	3.595	0.066	2.524	0.047
AQSR 24	276 Crockanboy Road	1.530	0.026	1.118	0.019	1.695	0.027	1.209	0.019
AQSR 25	146 Greencastle Road	1.450	0.023	1.024	0.016	1.548	0.024	1.092	0.017
AQSR 26	164 Greencastle Road (Presbytery)	1.285	0.019	0.922	0.014	1.345	0.020	0.944	0.014
AQSR 27	170 Greencastle Road	1.500	0.018	1.053	0.013	1.505	0.019	1.062	0.013
AQSR 28	172 Greencastle Road	1.397	0.019	1.018	0.013	1.512	0.020	1.066	0.014
AQSR 29	46 Mullydoo Road	1.303	0.018	0.941	0.013	1.453	0.019	1.035	0.013
AQSR 30	188 Greencastle Road	1.636	0.017	1.143	0.012	1.638	0.018	1.144	0.013

Table 8: Continued.

AQSR Ref No.	Address	1.72 M L Diesel / annum		1.72 M L HVO / annum		2.14 M L Diesel / annum		12.14 M L HVO / annum	
		99.79%ile of 1-Hour NO2 Conc µg/m^3	Annual Mean NO2 Conc µg/m^3	99.79%ile of 1-Hour NO2 Conc µg/m^3	Annual Mean NO2 Conc µg/m^3	99.79%ile of 1-Hour NO2 Conc µg/m^3	Annual Mean NO2 Conc µg/m^3	99.79%ile of 1-Hour NO2 Conc µg/m^3	Annual Mean NO2 Conc µg/m^3
AQSR 31	198 Greencastle Road	1.540	0.021	1.077	0.015	1.540	0.022	1.109	0.016
AQSR 32	200 Greencastle Road	1.056	0.018	0.745	0.013	1.057	0.019	0.770	0.013
AQSR 33	204 Greencastle Road	1.488	0.020	1.045	0.014	1.503	0.021	1.056	0.015
AQSR 34	208 Greencastle Road	1.100	0.023	0.782	0.017	1.139	0.024	0.800	0.017
AQSR 35	216 Greencastle Road	1.433	0.028	1.021	0.020	1.453	0.029	1.021	0.020
AQSR 36	K/2012/0141/RM Adjacent to 208 Crockanboy Road	2.962	0.061	1.984	0.043	2.832	0.062	1.998	0.044
AQSR 37	St Patrick's GFC	1.406	0.020	1.011	0.014	1.556	0.021	1.120	0.015
AQSR 38	Greencastle Amateur Boxing Club	1.357	0.019	0.986	0.014	1.519	0.020	1.077	0.014
AQSR 39	Greencastle Community Association	1.388	0.019	1.002	0.014	1.534	0.020	1.094	0.014
AQSR 40	St Patrick's Church, Sheskinshule	1.364	0.019	0.958	0.013	1.434	0.019	1.035	0.014
AQSR 41	Green Elves Nursery School	1.681	0.025	1.197	0.018	1.802	0.026	1.287	0.018
AQSR 42	Greencastle School	1.680	0.025	1.210	0.018	1.817	0.026	1.293	0.018
AQSR 43	35 Camcosy Road	0.970	0.016	0.699	0.012	1.113	0.018	0.820	0.013
AQSR 44	34 Camcosy Road	1.069	0.017	0.779	0.012	1.171	0.018	0.839	0.013
AQSR 45	Camcosy Road	1.005	0.019	0.742	0.014	1.166	0.022	0.817	0.016
AQSR 46	45 Camcosy Road	1.966	0.043	1.451	0.032	2.252	0.049	1.643	0.036
AQSR 47	49 Camcosy Road	3.824	0.049	2.846	0.036	4.530	0.057	3.339	0.041
AQSR 48	48 Camcosy Road	2.626	0.043	1.954	0.032	3.111	0.049	2.293	0.036
AQSR 49	Camcosy Road	1.369	0.035	1.018	0.026	1.550	0.039	1.121	0.029
AQSR 50	54 Camcosy Road	1.431	0.032	1.065	0.023	1.665	0.035	1.220	0.026
AQSR 51	57 Camcosy Road	1.522	0.033	1.068	0.024	1.571	0.037	1.148	0.027
AQSR 52	59 Camcosy Road	1.065	0.032	0.790	0.023	1.250	0.034	0.918	0.025
AQSR 53	Camcosy Road	0.934	0.030	0.671	0.022	1.017	0.032	0.743	0.023
AQSR 54	63 Camcosy Road	0.897	0.029	0.655	0.021	0.977	0.031	0.702	0.022
Maximum µg/m^3		**3.82**	**0.06**	**2.85**	**0.05**	**4.53**	**0.07**	**3.34**	**0.05**
%age of Limit Value 40 µg/m^3			**0.16%**		**0.11%**		**0.17%**		**0.12%**
%age of Limit Value 200 µg/m^3		**1.9%**		**1.4%**		**2.3%**		**1.7%**	

Discussion of Predicted Impacts at Human Receptors

1.77 The results from the dispersion modelling of the annual mean and 99.79%ile of 1-Hour Nitrogen Dioxide (NO_2) concentrations ($\mu g/m^3$) are presented in Table 8 versus the relevant limit values.

1.78 As shown in Table 8 and Appendix A, Figures A5 – A12, the worst-case ground level NO_2 concentrations are in close proximity to the DGL site.

1.79 The predicted annual mean and short term (99.79%ile of 1-Hour) ground level pollutant concentrations at human receptor locations in the vicinity of the proposed DGL are significantly lower than the maximum ground level concentrations in close proximity to the DGL site.

1.80 The predicted the annual mean and 99.79%ile of 1-Hour Nitrogen Dioxide (NO_2) concentrations ($\mu g/m^3$) in Table 8 are well below the relevant Air Quality Standard limit values.

1.81 In terms of the 'Significance of Potential Environmental Effects' the magnitude (scale of change) has been determined by considering the impacts of the proposed DGL site on the annual mean and 99.79%ile of 1-Hour Nitrogen Dioxide (NO_2) concentrations at the worst-affected sensitive human receptors with reference to the environmental assessment criteria.

1.82 In terms of predicted the annual mean and 99.79%ile of 1-Hour Nitrogen Dioxide (NO_2) concentrations (µg/m3), as impact descriptors for individual receptors as outlined in Table 6, there will be a negligible change due to the Process Contribution (PC) from the proposed DGL site.

1.83 The predicted annual mean and 99.79%ile of 1-Hour Nitrogen Dioxide (NO_2) concentrations ($\mu g/m^3$) at receptors will be less than 75% of the relevant Air Quality Assessment Level (AQAL) and the % Change in concentration relative to Air Quality Assessment Level (AQAL) will be <1%.

1.84 There is no predicted nitrogen dioxide (NO_2) impact at the nearest Grid Ref. in the Republic of Ireland at 230042, 388884. This location is 29.1 Km (18 miles) directly west of the proposed Curraghinalt Gold Mine Project site (See Figure 1). Therefore, no transboundary air quality impacts will occur at human receptor locations in Co. Donegal and beyond.

Predicted Impacts at Ecological Receptors (Designated Sites)

1.85 The NIEA recent assessment procedure, the 'Revised operational protocol for assessing air pollution impacts on the natural environment', states that the impact of air pollutants on vegetation and ecosystems should be assessed at the designated habitat sites within a distance of up to 15 km of the source, depending on the zone of influence.

1.86 The assessment should be undertaken at designated sites, including;

- Special Areas of Conservation (SACs) and candidate SACs (cSACs) designated under the EC Habitats Directive;

- Special Protection Areas (SPAs) and potential SPAs designated under the EC Birds Directive; and
- Ramsar Sites designated under the Convention on Wetlands of International Importance.

1.87 The impact of air pollutants on vegetation and ecosystems should also be assessed at the following local designation sites within the zone of influence of the source, including;

- Areas of Special Scientific Interest (ASSI);
- National Nature Reserves;
- Local Nature Reserves;
- Local Wildlife Sites; and
- Ancient Woodlands.

1.88 In line with the NIEA Impact Assessment Procedure, i.e. NIEA *Revised Operational Protocol for assessing ammonia and air pollution impacts on the natural environment*, the potential impact of the proposed DGL site has been assessed against the *De-minimis* Threshold, the *Site Relevant Threshold* (SRT) and the *'Screening Threshold' Test of Likely Significance* (ToLS).

1.89 An assessment of the in combination effect with other relevant plans and projects in the study area has been undertaken by adding the existing background NOx and nitrogen deposition rate at the designated sites to the predicted Process Contribution (PC). This gives the Predicted Env Concentration, i.e. the PEC (Background + PC). There are no proposed plans and projects in the study area that have the potential to emit significant NOx or NO_2 emissions.

1.90 The *de-minimis* threshold values are derived on a precautionary basis, for a 'worst case scenario' which assumes a high development pressure. Site-relevant thresholds are derived on a site-by-site basis, taking account of the characteristics and specific environmental conditions at a designated site. In principle, site relevant thresholds might take account of development pressure, emission types, background trends, source attribution data and the local circumstances which apply at a given site.

1.91 Reference has been made to the NIEA Nitrogen Emitting Developments Impact Assessment Procedure and the Joint Nature Conservation Committee (JNCC) *Report No. 696 Main Report Guidance on Decision-making Thresholds for Air Pollution* (2021), Section 4.2 Site-relevant threshold based on development pressure outlines the calculation methodology for a Site Relevant Threshold (SRT).

1.92 Using the methodology outlined in the NIEA *Revised Operational Protocol for assessing ammonia and air pollution impacts on the natural environment*, the following has been determined;

- The development area can be described as a "Remote Area (very little development)".
- This results in the area being described as an area with "Very Low Development Pressure".
- Therefore, the SRT (as a %age of the critical load or level) for on-site emission sources based on an area with "Very Low Development Pressure", is as follows;
  - NOx (µg/m^3) (based on Critical Level of 30 µg/m^3) => 0.29% = 0.087 µg/m^3
  - NDEP Woodland (based on Critical Level of 10 kg/ha/yr) => 1.3% = 0.13 kg/ha/yr

- NDEP Grassland (based on Critical Level of 10 kg/ha/yr) => 0.88% = 0.088 kg/ha/yr
- NH_3 (lichens / bryophytes) (based on Critical Level of 1 µg/m^3) => 0.75% = 0.0075 µg/m^3
- NH_3 (higher plants) (based on Critical Level of 3 µg/m^3) => 0.75% = 0.022 µg/m^3

1.93 The 'Screening Threshold' Test of Likely Significance (ToLS) is based on a limit of 0.4% of the Critical Level.

1.94 The predicted nitrogen oxide (NOx) concentrations at the designated habitat sites within 15 Km of the proposed DGL site is reported in Tables 9 – 16.

1.95 The results of the air dispersion modelling study showing the predicted Annual Mean NOx concentrations have been presented as pollutant dispersion isopleths (See Appendix A, Figures A1 – A4), which indicate the dispersion of the process contribution NOx emissions from the proposed DGL site.

1.96 The predicted nitrogen deposition rates at the designated habitat sites within 15 Km of the proposed DGL site have been calculated from the predicted NOx concentrations using the methodology outlined in the AQTAG06[1], Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Status: Updated version, March 2014), as follows;

Dry deposition flux (µg/m^2/s) = annual mean ground-level concentration (µg/m^3) x deposition velocity (m/s)

EXAMPLE

= 14.4 µg/m^3 x 0.0015 m/s

= 0.0216 µg/m^2/s

When expressed in units of kg ha-1 year-1 as N

= 0.0216 x 96 kg/ha/year

NO_2 Dry deposition flux (kg/ha/year) = 2.07 kg/ha/year as N

NO_2 Deposition Velocity (m/s)

Grassland	0.0015
Forest	0.003

NO_2 Conversion factor µg/m^2/s of species X to kg/ha/year.

[As referenced in the IAQM Guidance, A guide to the assessment of air quality impacts on designated nature conservation sites (Version 1.0 June 2019)]

[1] Air Quality Advisory Group, 2014, AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air

Table 9: Predicted annual mean nitrogen oxide (NOx) concentrations from the DGL site at designated habitats in closest proximity to the DGL site – **Scenario 1, Life of Mine Average of 1,717,175 million litres of diesel / annum**

- SRT (as a %age of the critical load or level) for on-site emission sources based on an area with "Very Low Development Pressure" for NOx (based on Critical Level of 30 µg/m3) => 0.29% = 0.087 µg/m^3
- 'Screening Threshold' Test of Likely Significance (ToLS) => 0.4% of the Critical Level = 0.12 µg/m^3.

Ref.	Site	PC NOx (µg/m^3)	NOx Background (ug m-3) [from SCAIL / APIS]	NOx PEC (µg/m^3)	NOx EAL (ug m-3) [from Air Quality Standards]	**% of NOx PC to EAL**	% of NOx PC to NOx Background	% of NOx PEC to EAL	NITROGEN HABITAT
ECO1	Owenkillew River	0.1109	3.34	3.45	30	0.370%	3.322%	11.5%	Bog woodland
ECO2	Owenkillew River	0.1109	3.34	3.45	30	0.370%	3.322%	11.5%	Oakwood
ECO3	Drumlea and Mullan Woods	0.0594	3.42	3.48	30	0.198%	1.737%	11.6%	Wet woodland
ECO4	Owenreagh River	0.0461	3.75	3.80	30	0.154%	1.229%	12.7%	Margaritifera margaritifera
ECO5	Mullaghcarn	0.0253	3.29	3.32	30	0.084%	0.768%	11.1%	Blanket bog
ECO6	Cashel Rock	0.0357	3.42	3.46	30	0.119%	1.043%	11.5%	-
ECO7	Murrins	0.0133	3.68	3.69	30	0.044%	0.361%	12.3%	Blanket bog
ECO8	Black Bog	0.0161	3.46	3.48	30	0.054%	0.466%	11.6%	Active raised bogs
ECO9	Black Bog	0.0161	3.46	3.48	30	0.054%	0.466%	11.6%	Lowland raised bog
ECO10	Mountfield Quarry	0.0095	3.47	3.48	30	0.032%	0.274%	11.6%	-
ECO11	Lough Macrory	0.0078	3.72	3.73	30	0.026%	0.210%	12.4%	-
ECO12	Lough Lark	0.0053	3.11	3.12	30	0.018%	0.170%	10.4%	-
ECO13	Owenkillew and Glenelly Woods	0.0058	3.41	3.42	30	0.019%	0.171%	11.4%	Oakwood
ECO14	Upper Ballinderry River	0.0084	3.67	3.68	30	0.028%	0.229%	12.3%	Lutra lutra

Table 9: Continued.

Ref.	Site	PC NOx (µg/m^3)	NOx Background (ug m-3) [from SCAIL / APIS]	NOx PEC (µg/m^3)	NOx EAL (ug m-3) [from Air Quality Standards]	**% of NOx PC to EAL**	% of NOx PC to NOx Background	% of NOx PEC to EAL	NITROGEN HABITAT
ECO15	Upper Ballinderry River	0.0084	3.67	3.68	30	0.028%	0.229%	12.3%	Blanket bogs (* if active bog)
ECO16	Lough Doo	0.0069	4.01	4.02	30	0.023%	0.173%	13.4%	-
ECO 17	Butterlope Glen	0.0049	3.07	3.07	30	0.016%	0.161%	10.2%	-
ECO 18	Aghabrack	0.0042	3.16	3.16	30	0.014%	0.132%	10.5%	-
ECO 19	Crockaghole Wood	0.0047	3.52	3.52	30	0.016%	0.132%	11.7%	Oakwood
ECO 20	River Faughan and Tributaries	0.0039	3.17	3.17	30	0.013%	0.122%	10.6%	Old sessile oak woods with Ilex and Blechnum in the British Isles
ECO 21	River Faughan and Tributaries	0.0039	3.17	3.17	30	0.013%	0.122%	10.6%	Oakwood
ECO 22	Deroran Bog	0.0031	3.84	3.84	30	0.010%	0.080%	12.8%	Lowland raised bog
ECO 23	Deroran Bog	0.0031	3.84	3.84	30	0.010%	0.080%	12.8%	Active raised bogs
ECO 24	Teal Lough and Slaghtfreeden Bogs	0.0035	3.73	3.73	30	0.012%	0.094%	12.4%	Blanket bog

Note; PC = Process Contribution, PEC = Predicted Environmental Concentration & EAL = Environmental Assessment Level. NOx Bkg from APIS.

Table 10: Predicted annual mean nitrogen oxide (NOx) concentrations from the DGL site at designated habitats in closest proximity to the DGL site – **Scenario 2, Life of Mine Average of 1,717,175 million litres of HVO / annum**

- SRT (as a %age of the critical load or level) for on-site emission sources based on an area with "Very Low Development Pressure" for NOx (based on Critical Level of 30 µg/m3) => 0.29% = 0.087 µg/m^3
- 'Screening Threshold' Test of Likely Significance (ToLS) => 0.4% of the Critical Level = 0.12 µg/m^3.

Ref.	Site	PC NOx (µg/m^3)	NOx Background (ug m-3) [from SCAIL / APIS]	NOx PEC (µg/m^3)	NOx EAL (ug m-3) [from Air Quality Standards]	**% of NOx PC to EAL**	% of NOx PC to NOx Background	% of NOx PEC to EAL	NITROGEN HABITAT
ECO1	Owenkillew River	0.0812	3.34	3.42	30	0.271%	2.432%	11.4%	Bog woodland
ECO2	Owenkillew River	0.0812	3.34	3.42	30	0.271%	2.432%	11.4%	Oakwood
ECO3	Drumlea and Mullan Woods	0.0432	3.42	3.46	30	0.144%	1.264%	11.5%	Wet woodland
ECO4	Owenreagh River	0.0328	3.75	3.78	30	0.109%	0.874%	12.6%	Margaritifera margaritifera
ECO5	Mullaghcarn	0.0182	3.29	3.31	30	0.061%	0.554%	11.0%	Blanket bog
ECO6	Cashel Rock	0.0254	3.42	3.45	30	0.085%	0.743%	11.5%	-
ECO7	Murrins	0.0094	3.68	3.69	30	0.031%	0.257%	12.3%	Blanket bog
ECO8	Black Bog	0.0115	3.46	3.47	30	0.038%	0.333%	11.6%	Active raised bogs
ECO9	Black Bog	0.0115	3.46	3.47	30	0.038%	0.333%	11.6%	Lowland raised bog
ECO10	Mountfield Quarry	0.0068	3.47	3.48	30	0.023%	0.195%	11.6%	-
ECO11	Lough Macrory	0.0056	3.72	3.73	30	0.019%	0.150%	12.4%	-
ECO12	Lough Lark	0.0038	3.11	3.11	30	0.013%	0.123%	10.4%	-
ECO13	Owenkillew and Glenelly Woods	0.0042	3.41	3.41	30	0.014%	0.123%	11.4%	Oakwood
ECO14	Upper Ballinderry River	0.0060	3.67	3.68	30	0.020%	0.164%	12.3%	Lutra lutra

Table 10: Continued.

Ref.	Site	PC NOx (µg/m^3)	NOx Background (ug m-3) [from SCAIL / APIS]	NOx PEC (µg/m^3)	NOx EAL (ug m-3) [from Air Quality Standards]	**% of NOx PC to EAL**	% of NOx PC to NOx Background	% of NOx PEC to EAL	NITROGEN HABITAT
ECO15	Upper Ballinderry River	0.0060	3.67	3.68	30	0.020%	0.164%	12.3%	Blanket bogs (* if active bog)
ECO16	Lough Doo	0.0050	4.01	4.01	30	0.017%	0.124%	13.4%	-
ECO 17	Butterlope Glen	0.0036	3.07	3.07	30	0.012%	0.116%	10.2%	-
ECO 18	Aghabrack	0.0030	3.16	3.16	30	0.010%	0.095%	10.5%	-
ECO 19	Crockaghole Wood	0.0034	3.52	3.52	30	0.011%	0.095%	11.7%	Oakwood
ECO 20	River Faughan and Tributaries	0.0028	3.17	3.17	30	0.009%	0.088%	10.6%	Old sessile oak woods with Ilex and Blechnum in the British Isles
ECO 21	River Faughan and Tributaries	0.0028	3.17	3.17	30	0.009%	0.088%	10.6%	Oakwood
ECO 22	Deroran Bog	0.0022	3.84	3.84	30	0.007%	0.057%	12.8%	Lowland raised bog
ECO 23	Deroran Bog	0.0022	3.84	3.84	30	0.007%	0.057%	12.8%	Active raised bogs
ECO 24	Teal Lough and Slaghtfreeden Bogs	0.0025	3.73	3.73	30	0.008%	0.068%	12.4%	Blanket bog

Note; PC = Process Contribution, PEC = Predicted Environmental Concentration & EAL = Environmental Assessment Level. NOx Bkg from APIS.

Table 11: Predicted annual mean nitrogen oxide (NOx) concentrations from the DGL site at designated habitats in closest proximity to the DGL site – **Scenario 3, Annual Peak of 2,143,407 million litres of diesel / annum**

- SRT (as a %age of the critical load or level) for on-site emission sources based on an area with "Very Low Development Pressure" for NOx (based on Critical Level of 30 µg/m3) => 0.29% = 0.087 µg/m^3
- 'Screening Threshold' Test of Likely Significance (ToLS) => 0.4% of the Critical Level = 0.12 µg/m^3.

Ref.	Site	PC NOx (µg/m^3)	NOx Background (ug m-3) [from SCAIL / APIS]	NOx PEC (µg/m^3)	NOx EAL (ug m-3) [from Air Quality Standards]	**% of NOx PC to EAL**	% of NOx PC to NOx Background	% of NOx PEC to EAL	NITROGEN HABITAT
ECO1	Owenkillew River	0.1258	3.34	3.47	30	0.419%	3.767%	11.6%	Bog woodland
ECO2	Owenkillew River	0.1258	3.34	3.47	30	0.419%	3.767%	11.6%	Oakwood
ECO3	Drumlea and Mullan Woods	0.0662	3.42	3.49	30	0.221%	1.937%	11.6%	Wet woodland
ECO4	Owenreagh River	0.0482	3.75	3.80	30	0.161%	1.285%	12.7%	Margaritifera margaritifera
ECO5	Mullaghcarn	0.0275	3.29	3.32	30	0.092%	0.836%	11.1%	Blanket bog
ECO6	Cashel Rock	0.0374	3.42	3.46	30	0.125%	1.094%	11.5%	-
ECO7	Murrins	0.0139	3.68	3.69	30	0.046%	0.377%	12.3%	Blanket bog
ECO8	Black Bog	0.0171	3.46	3.48	30	0.057%	0.494%	11.6%	Active raised bogs
ECO9	Black Bog	0.0171	3.46	3.48	30	0.057%	0.494%	11.6%	Lowland raised bog
ECO10	Mountfield Quarry	0.0100	3.47	3.48	30	0.033%	0.287%	11.6%	-
ECO11	Lough Macrory	0.0082	3.72	3.73	30	0.027%	0.222%	12.4%	-
ECO12	Lough Lark	0.0059	3.11	3.12	30	0.020%	0.189%	10.4%	-
ECO13	Owenkillew and Glenelly Woods	0.0063	3.41	3.42	30	0.021%	0.183%	11.4%	Oakwood
ECO14	Upper Ballinderry River	0.0090	3.67	3.68	30	0.030%	0.244%	12.3%	Lutra lutra

Table 11: Continued.

Ref.	Site	PC NOx (µg/m^3)	NOx Background (ug m-3) [from SCAIL / APIS]	NOx PEC (µg/m^3)	NOx EAL (ug m-3) [from Air Quality Standards]	**% of NOx PC to EAL**	% of NOx PC to NOx Background	% of NOx PEC to EAL	NITROGEN HABITAT
ECO15	Upper Ballinderry River	0.0090	3.67	3.68	30	0.030%	0.244%	12.3%	Blanket bogs (* if active bog)
ECO16	Lough Doo	0.0074	4.01	4.02	30	0.025%	0.185%	13.4%	-
ECO 17	Butterlope Glen	0.0053	3.07	3.08	30	0.018%	0.173%	10.3%	-
ECO 18	Aghabrack	0.0045	3.16	3.16	30	0.015%	0.142%	10.5%	-
ECO 19	Crockaghole Wood	0.0050	3.52	3.53	30	0.017%	0.143%	11.8%	Oakwood
ECO 20	River Faughan and Tributaries	0.0042	3.17	3.17	30	0.014%	0.134%	10.6%	Old sessile oak woods with Ilex and Blechnum in the British Isles
ECO 21	River Faughan and Tributaries	0.0042	3.17	3.17	30	0.014%	0.134%	10.6%	Oakwood
ECO 22	Deroran Bog	0.0033	3.84	3.84	30	0.011%	0.085%	12.8%	Lowland raised bog
ECO 23	Deroran Bog	0.0033	3.84	3.84	30	0.011%	0.085%	12.8%	Active raised bogs
ECO 24	Teal Lough and Slaghtfreeden Bogs	0.0038	3.73	3.73	30	0.013%	0.101%	12.4%	Blanket bog

Note; PC = Process Contribution, PEC = Predicted Environmental Concentration & EAL = Environmental Assessment Level. NOx Bkg from APIS.

Table 12: Predicted annual mean nitrogen oxide (NOx) concentrations from the DGL site at designated habitats in closest proximity to the DGL site – **Scenario 4, Annual Peak of 2,143,407 million litres of HVO / annum**

- SRT (as a %age of the critical load or level) for on-site emission sources based on an area with "Very Low Development Pressure" for NOx (based on Critical Level of 30 µg/m3) => 0.29% = 0.087 µg/m^3
- 'Screening Threshold' Test of Likely Significance (ToLS) => 0.4% of the Critical Level = 0.12 µg/m^3.

Ref.	Site	PC NOx (µg/m^3)	NOx Background (ug m-3) [from SCAIL / APIS]	NOx PEC (µg/m^3)	NOx EAL (ug m-3) [from Air Quality Standards]	**% of NOx PC to EAL**	% of NOx PC to NOx Background	% of NOx PEC to EAL	NITROGEN HABITAT
ECO1	Owenkillew River	0.1006	3.34	3.44	30	0.335%	3.010%	11.5%	Bog woodland
ECO2	Owenkillew River	0.1006	3.34	3.44	30	0.335%	3.010%	11.5%	Oakwood
ECO3	Drumlea and Mullan Woods	0.0546	3.42	3.47	30	0.182%	1.596%	11.6%	Wet woodland
ECO4	Owenreagh River	0.0446	3.75	3.79	30	0.149%	1.189%	12.6%	Margaritifera margaritifera
ECO5	Mullaghcarn	0.0235	3.29	3.31	30	0.078%	0.715%	11.0%	Blanket bog
ECO6	Cashel Rock	0.0344	3.42	3.45	30	0.115%	1.005%	11.5%	-
ECO7	Murrins	0.0128	3.68	3.69	30	0.043%	0.348%	12.3%	Blanket bog
ECO8	Black Bog	0.0154	3.46	3.48	30	0.051%	0.445%	11.6%	Active raised bogs
ECO9	Black Bog	0.0154	3.46	3.48	30	0.051%	0.445%	11.6%	Lowland raised bog
ECO10	Mountfield Quarry	0.0092	3.47	3.48	30	0.031%	0.264%	11.6%	-
ECO11	Lough Macrory	0.0075	3.72	3.73	30	0.025%	0.202%	12.4%	-
ECO12	Lough Lark	0.0048	3.11	3.11	30	0.016%	0.156%	10.4%	-
ECO13	Owenkillew and Glenelly Woods	0.0055	3.41	3.42	30	0.018%	0.161%	11.4%	Oakwood
ECO14	Upper Ballinderry River	0.0080	3.67	3.68	30	0.027%	0.217%	12.3%	Lutra lutra

Table 12: Continued.

Ref.	Site	PC NOx (µg/m^3)	NOx Background (ug m-3) [from SCAIL / APIS]	NOx PEC (µg/m^3)	NOx EAL (ug m-3) [from Air Quality Standards]	**% of NOx PC to EAL**	% of NOx PC to NOx Background	% of NOx PEC to EAL	NITROGEN HABITAT
ECO15	Upper Ballinderry River	0.0080	3.67	3.68	30	0.027%	0.217%	12.3%	Blanket bogs (* if active bog)
ECO16	Lough Doo	0.0066	4.01	4.02	30	0.022%	0.164%	13.4%	-
ECO 17	Butterlope Glen	0.0046	3.07	3.07	30	0.015%	0.151%	10.2%	-
ECO 18	Aghabrack	0.0039	3.16	3.16	30	0.013%	0.123%	10.5%	-
ECO 19	Crockaghole Wood	0.0044	3.52	3.52	30	0.015%	0.124%	11.7%	Oakwood
ECO 20	River Faughan and Tributaries	0.0036	3.17	3.17	30	0.012%	0.114%	10.6%	Old sessile oak woods with Ilex and Blechnum in the British Isles
ECO 21	River Faughan and Tributaries	0.0036	3.17	3.17	30	0.012%	0.114%	10.6%	Oakwood
ECO 22	Deroran Bog	0.0029	3.84	3.84	30	0.010%	0.077%	12.8%	Lowland raised bog
ECO 23	Deroran Bog	0.0029	3.84	3.84	30	0.010%	0.077%	12.8%	Active raised bogs
ECO 24	Teal Lough and Slaghtfreeden Bogs	0.0033	3.73	3.73	30	0.011%	0.089%	12.4%	Blanket bog

Note; PC = Process Contribution, PEC = Predicted Environmental Concentration & EAL = Environmental Assessment Level. NOx Bkg from APIS.

Table 13: Predicted **nitrogen deposition rate (NDep)** from the DGL site at designated habitats in closest proximity to the DGL site – **Scenario 1, Life of Mine Average of 1,717,175 million litres of diesel / annum**.

Ref.	Site	PC NDEP (kg/ha/yr) [From AQTAG06 Conversion Rate]	NDEP Background (kg/ha/yr) [from SCAIL / APIS]	NDEP TOTAL (kg/ha/yr)	NDEP CLOAD (kg/ha/yr) [from SCAIL / APIS]	Site Relevant Threshold %age	'Screening Threshold' Test of Likely Significance (ToLS).	**% of Ndep PC to CLoad**	% of Ndep PC to NDEP Background	% of Ndep PEC to CLoad	NITROGEN HABITAT
ECO1	Owenkillew River	0.0320	24.7	24.73	5	1.30%	1.70%	0.639%	0.129%	495%	Bog woodland
ECO2	Owenkillew River	0.0320	24.7	24.73	10	1.30%	1.70%	0.320%	0.129%	247%	Oakwood
ECO3	Drumlea and Mullan Woods	0.0171	24.32	24.34	5	1.30%	1.70%	0.342%	0.070%	487%	Wet woodland
ECO4	Owenreagh River	0.0066	15.12	15.13					0.044%		Margaritifera margaritifera
ECO5	Mullaghcarn	0.0036	13.81	13.81	5	0.88%	1.20%	0.073%	0.026%	276%	Blanket bog
ECO6	Cashel Rock	0.0051	15.08	15.09					0.034%		
ECO7	Murrins	0.0019	15.23	15.23	5	0.88%	1.20%	0.038%	0.013%	305%	Blanket bog
ECO8	Black Bog	0.0023	15.34	15.34	5	0.88%	1.20%	0.046%	0.015%	307%	Active raised bogs
ECO9	Black Bog	0.0023	15.34	15.34	5	0.88%	1.20%	0.046%	0.015%	307%	Lowland raised bog
ECO10	Mountfield Quarry	0.0014	14.98	14.98					0.009%		
ECO11	Lough Macrory	0.0011	16.18	16.18					0.007%		
ECO12	Lough Lark	0.0008	14.54	14.54					0.005%		
ECO13	Owenkillew and Glenelly Woods	0.0017	22.69	22.69	10	1.30%	1.70%	0.017%	0.007%	227%	Oakwood
ECO14	Upper Ballinderry River	0.0012	16.77	16.77					0.007%		Lutra lutra

Table 13: Continued.

Ref.	Site	PC NDEP (kg/ha/yr) [From AQTAG06 Conversion Rate]	NDEP Background (kg/ha/yr) [from SCAIL / APIS]	NDEP TOTAL (kg/ha/yr)	NDEP CLOAD (kg/ha/yr) [from SCAIL / APIS]	Site Relevant Threshold %age	'Screening Threshold' Test of Likely Significance (ToLS).	**% of Ndep PC to CLoad**	% of Ndep PC to NDEP Background	% of Ndep PEC to CLoad	NITROGEN HABITAT
ECO15	Upper Ballinderry River	0.0012	16.77	16.77	5	0.88%	1.20%	0.024%	0.007%	335%	Blanket bogs (* if active bog)
ECO16	Lough Doo	0.0010	17.19	17.19					0.006%		
ECO 17	Butterlope Glen	0.0007	14.33	14.33					0.005%		
ECO 18	Aghabrack	0.0006	13.66	13.66					0.004%		
ECO 19	Crockaghole Wood	0.0013	24.12	24.12	10	1.30%	1.70%	0.013%	0.006%	241%	Oakwood
ECO 20	River Faughan and Tributaries	0.0011	21.02	21.02	10	1.30%	1.70%	0.011%	0.005%	210%	Old sessile oak woods with Ilex and Blechnum in the British Isles
ECO 21	River Faughan and Tributaries	0.0006	21.02	21.02	10	1.30%	1.70%	0.006%	0.003%	210%	Oakwood
ECO 22	Deroran Bog	0.0004	16.25	16.25	5	0.88%	1.20%	0.009%	0.003%	325%	Lowland raised bog
ECO 23	Deroran Bog	0.0004	16.25	16.25	5	0.88%	1.20%	0.009%	0.003%	325%	Active raised bogs
ECO 24	Teal Lough and Slaghtfreeden Bogs	0.0005	16.51	16.51	5	0.88%	1.20%	0.010%	0.003%	330%	Blanket bog

Note; PC = Process Contribution, PEC = Predicted Environmental Concentration & EAL = Environmental Assessment Level. NOx Bkg from APIS.

Table 14: Predicted **nitrogen deposition rate (NDep)** from the DGL site at designated habitats in closest proximity to the DGL site – **Scenario 2, Life of Mine Average of 1,717,175 million litres of HVO / annum**.

Ref.	Site	PC NDEP (kg/ha/yr) [From AQTAG06 Conversion Rate]	NDEP Background (kg/ha/yr) [from SCAIL / APIS]	NDEP TOTAL (kg/ha/yr)	NDEP CLOAD (kg/ha/yr) [from SCAIL / APIS]	Site Relevant Threshold %age	'Screening Threshold' Test of Likely Significance (ToLS).	**% of Ndep PC to CLoad**	% of Ndep PC to NDEP Background	% of Ndep PEC to CLoad	NITROGEN HABITAT
ECO1	Owenkillew River	0.0234	24.7	24.72	5	1.30%	1.70%	0.468%	0.095%	494%	Bog woodland
ECO2	Owenkillew River	0.0234	24.7	24.72	10	1.30%	1.70%	0.234%	0.095%	247%	Oakwood
ECO3	Drumlea and Mullan Woods	0.0125	24.32	24.33	5	1.30%	1.70%	0.249%	0.051%	487%	Wet woodland
ECO4	Owenreagh River	0.0047	15.12	15.12					0.031%		Margaritifera margaritifera
ECO5	Mullaghcarn	0.0026	13.81	13.81	5	0.88%	1.20%	0.053%	0.019%	276%	Blanket bog
ECO6	Cashel Rock	0.0037	15.08	15.08					0.024%		
ECO7	Murrins	0.0014	15.23	15.23	5	0.88%	1.20%	0.027%	0.009%	305%	Blanket bog
ECO8	Black Bog	0.0017	15.34	15.34	5	0.88%	1.20%	0.033%	0.011%	307%	Active raised bogs
ECO9	Black Bog	0.0017	15.34	15.34	5	0.88%	1.20%	0.033%	0.011%	307%	Lowland raised bog
ECO10	Mountfield Quarry	0.0010	14.98	14.98					0.007%		
ECO11	Lough Macrory	0.0008	16.18	16.18					0.005%		
ECO12	Lough Lark	0.0006	14.54	14.54					0.004%		
ECO13	Owenkillew and Glenelly Woods	0.0012	22.69	22.69	10	1.30%	1.70%	0.012%	0.005%	227%	Oakwood
ECO14	Upper Ballinderry River	0.0009	16.77	16.77					0.005%		Lutra lutra

Table 14: Continued.

Ref.	Site	PC NDEP (kg/ha/yr) [From AQTAG06 Conversion Rate]	NDEP Background (kg/ha/yr) [from SCAIL / APIS]	NDEP TOTAL (kg/ha/yr)	NDEP CLOAD (kg/ha/yr) [from SCAIL / APIS]	Site Relevant Threshold %age	'Screening Threshold' Test of Likely Significance (ToLS).	**% of Ndep PC to CLoad**	% of Ndep PC to NDEP Background	% of Ndep PEC to CLoad	NITROGEN HABITAT
ECO15	Upper Ballinderry River	0.0009	16.77	16.77	5	0.88%	1.20%	0.017%	0.005%	335%	Blanket bogs (* if active bog)
ECO16	Lough Doo	0.0007	17.19	17.19					0.004%		
ECO 17	Butterlope Glen	0.0005	14.33	14.33					0.004%		
ECO 18	Aghabrack	0.0004	13.66	13.66					0.003%		
ECO 19	Crockaghole Wood	0.0010	24.12	24.12	10	1.30%	1.70%	0.010%	0.004%	241%	Oakwood
ECO 20	River Faughan and Tributaries	0.0008	21.02	21.02	10	1.30%	1.70%	0.008%	0.004%	210%	Old sessile oak woods with Ilex and Blechnum in the British Isles
ECO 21	River Faughan and Tributaries	0.0004	21.02	21.02	10	1.30%	1.70%	0.004%	0.002%	210%	Oakwood
ECO 22	Deroran Bog	0.0003	16.25	16.25	5	0.88%	1.20%	0.006%	0.002%	325%	Lowland raised bog
ECO 23	Deroran Bog	0.0003	16.25	16.25	5	0.88%	1.20%	0.006%	0.002%	325%	Active raised bogs
ECO 24	Teal Lough and Slaghtfreeden Bogs	0.0004	16.51	16.51	5	0.88%	1.20%	0.007%	0.002%	330%	Blanket bog

Note; PC = Process Contribution, PEC = Predicted Environmental Concentration & EAL = Environmental Assessment Level. NOx Bkg from APIS.

Table 15: Predicted **nitrogen deposition rate (NDep)** from the DGL site at designated habitats in closest proximity to the DGL site – **Scenario 3, Annual Peak of 2,143,407 million litres of diesel / annum**

Ref.	Site	PC NDEP (kg/ha/yr) [From AQTAG06 Conversion Rate]	NDEP Background (kg/ha/yr) [from SCAIL / APIS]	NDEP TOTAL (kg/ha/yr)	NDEP CLOAD (kg/ha/yr) [from SCAIL / APIS]	Site Relevant Threshold %age	'Screening Threshold' Test of Likely Significance (ToLS).	**% of Ndep PC to CLoad**	% of Ndep PC to NDEP Background	% of Ndep PEC to CLoad	NITROGEN HABITAT
ECO1	Owenkillew River	0.0362	24.7	24.74	5	1.30%	1.70%	0.725%	0.147%	495%	Bog woodland
ECO2	Owenkillew River	0.0362	24.7	24.74	10	1.30%	1.70%	0.362%	0.147%	247%	Oakwood
ECO3	Drumlea and Mullan Woods	0.0191	24.32	24.34	5	1.30%	1.70%	0.382%	0.078%	487%	Wet woodland
ECO4	Owenreagh River	0.0069	15.12	15.13					0.046%		Margaritifera margaritifera
ECO5	Mullaghcarn	0.0040	13.81	13.81	5	0.88%	1.20%	0.079%	0.029%	276%	Blanket bog
ECO6	Cashel Rock	0.0054	15.08	15.09					0.036%		
ECO7	Murrins	0.0020	15.23	15.23	5	0.88%	1.20%	0.040%	0.013%	305%	Blanket bog
ECO8	Black Bog	0.0025	15.34	15.34	5	0.88%	1.20%	0.049%	0.016%	307%	Active raised bogs
ECO9	Black Bog	0.0025	15.34	15.34	5	0.88%	1.20%	0.049%	0.016%	307%	Lowland raised bog
ECO10	Mountfield Quarry	0.0014	14.98	14.98					0.010%		
ECO11	Lough Macrory	0.0012	16.18	16.18					0.007%		
ECO12	Lough Lark	0.0008	14.54	14.54					0.006%		
ECO13	Owenkillew and Glenelly Woods	0.0018	22.69	22.69	10	1.30%	1.70%	0.018%	0.008%	227%	Oakwood
ECO14	Upper Ballinderry River	0.0013	16.77	16.77					0.008%		Lutra lutra

Table 15: Continued.

Ref.	Site	PC NDEP (kg/ha/yr) [From AQTAG06 Conversion Rate]	NDEP Background (kg/ha/yr) [from SCAIL / APIS]	NDEP TOTAL (kg/ha/yr)	NDEP CLOAD (kg/ha/yr) [from SCAIL / APIS]	Site Relevant Threshold %age	'Screening Threshold' Test of Likely Significance (ToLS).	**% of Ndep PC to CLoad**	% of Ndep PC to NDEP Background	% of Ndep PEC to CLoad	NITROGEN HABITAT
ECO15	Upper Ballinderry River	0.0013	16.77	16.77	5	0.88%	1.20%	0.026%	0.008%	335%	Blanket bogs (* if active bog)
ECO16	Lough Doo	0.0011	17.19	17.19					0.006%		
ECO 17	Butterlope Glen	0.0008	14.33	14.33					0.005%		
ECO 18	Aghabrack	0.0006	13.66	13.66					0.005%		
ECO 19	Crockaghole Wood	0.0014	24.12	24.12	10	1.30%	1.70%	0.014%	0.006%	241%	Oakwood
ECO 20	River Faughan and Tributaries	0.0012	21.02	21.02	10	1.30%	1.70%	0.012%	0.006%	210%	Old sessile oak woods with Ilex and Blechnum in the British Isles
ECO 21	River Faughan and Tributaries	0.0006	21.02	21.02	10	1.30%	1.70%	0.006%	0.003%	210%	Oakwood
ECO 22	Deroran Bog	0.0005	16.25	16.25	5	0.88%	1.20%	0.009%	0.003%	325%	Lowland raised bog
ECO 23	Deroran Bog	0.0005	16.25	16.25	5	0.88%	1.20%	0.009%	0.003%	325%	Active raised bogs
ECO 24	Teal Lough and Slaghtfreeden Bogs	0.0005	16.51	16.51	5	0.88%	1.20%	0.011%	0.003%	330%	Blanket bog

Note; PC = Process Contribution, PEC = Predicted Environmental Concentration & EAL = Environmental Assessment Level. NOx Bkg from APIS.

Table 16: Predicted **nitrogen deposition rate (NDep)** from the DGL site at designated habitats in closest proximity to the DGL site – **Scenario 4, Annual Peak of 2,143,407 million litres of HVO / annum**

Ref.	Site	PC NDEP (kg/ha/yr) [From AQTAG06 Conversion Rate]	NDEP Background (kg/ha/yr) [from SCAIL / APIS]	NDEP TOTAL (kg/ha/yr)	NDEP CLOAD (kg/ha/yr) [from SCAIL / APIS]	Site Relevant Threshold %age	'Screening Threshold' Test of Likely Significance (ToLS).	**% of Ndep PC to CLoad**	% of Ndep PC to NDEP Background	% of Ndep PEC to CLoad	NITROGEN HABITAT
ECO1	Owenkillew River	0.0290	24.7	24.73	5	1.30%	1.70%	0.579%	0.117%	495%	Bog woodland
ECO2	Owenkillew River	0.0290	24.7	24.73	10	1.30%	1.70%	0.290%	0.117%	247%	Oakwood
ECO3	Drumlea and Mullan Woods	0.0157	24.32	24.34	5	1.30%	1.70%	0.314%	0.065%	487%	Wet woodland
ECO4	Owenreagh River	0.0064	15.12	15.13					0.042%		Margaritifera margaritifera
ECO5	Mullaghcarn	0.0034	13.81	13.81	5	0.88%	1.20%	0.068%	0.025%	276%	Blanket bog
ECO6	Cashel Rock	0.0050	15.08	15.08					0.033%		
ECO7	Murrins	0.0018	15.23	15.23	5	0.88%	1.20%	0.037%	0.012%	305%	Blanket bog
ECO8	Black Bog	0.0022	15.34	15.34	5	0.88%	1.20%	0.044%	0.014%	307%	Active raised bogs
ECO9	Black Bog	0.0022	15.34	15.34	5	0.88%	1.20%	0.044%	0.014%	307%	Lowland raised bog
ECO10	Mountfield Quarry	0.0013	14.98	14.98					0.009%		
ECO11	Lough Macrory	0.0011	16.18	16.18					0.007%		
ECO12	Lough Lark	0.0007	14.54	14.54					0.005%		
ECO13	Owenkillew and Glenelly Woods	0.0016	22.69	22.69	10	1.30%	1.70%	0.016%	0.007%	227%	Oakwood
ECO14	Upper Ballinderry River	0.0011	16.77	16.77					0.007%		Lutra lutra

Table 16: Continued.

Ref.	Site	PC NDEP (kg/ha/yr) [From AQTAG06 Conversion Rate]	NDEP Background (kg/ha/yr) [from SCAIL / APIS]	NDEP TOTAL (kg/ha/yr)	NDEP CLOAD (kg/ha/yr) [from SCAIL / APIS]	Site Relevant Threshold %age	'Screening Threshold' Test of Likely Significance (ToLS).	**% of Ndep PC to CLoad**	% of Ndep PC to NDEP Background	% of Ndep PEC to CLoad	NITROGEN HABITAT
ECO15	Upper Ballinderry River	0.0011	16.77	16.77	5	0.88%	1.20%	0.023%	0.007%	335%	Blanket bogs (* if active bog)
ECO16	Lough Doo	0.0009	17.19	17.19					0.006%		
ECO 17	Butterlope Glen	0.0007	14.33	14.33					0.005%		
ECO 18	Aghabrack	0.0006	13.66	13.66					0.004%		
ECO 19	Crockaghole Wood	0.0013	24.12	24.12	10	1.30%	1.70%	0.013%	0.005%	241%	Oakwood
ECO 20	River Faughan and Tributaries	0.0010	21.02	21.02	10	1.30%	1.70%	0.010%	0.005%	210%	Old sessile oak woods with Ilex and Blechnum in the British Isles
ECO 21	River Faughan and Tributaries	0.0005	21.02	21.02	10	1.30%	1.70%	0.005%	0.002%	210%	Oakwood
ECO 22	Deroran Bog	0.0004	16.25	16.25	5	0.88%	1.20%	0.008%	0.003%	325%	Lowland raised bog
ECO 23	Deroran Bog	0.0004	16.25	16.25	5	0.88%	1.20%	0.008%	0.003%	325%	Active raised bogs
ECO 24	Teal Lough and Slaghtfreeden Bogs	0.0005	16.51	16.51	5	0.88%	1.20%	0.010%	0.003%	330%	Blanket bog

Note; PC = Process Contribution, PEC = Predicted Environmental Concentration & EAL = Environmental Assessment Level. NOx Bkg from APIS.

Discussion of Predicted Impacts at Ecological Receptors (Designated Sites)

1.97 The air dispersion models include NOx emissions from Underground Mining sources (via the new vent raise and portal emissions, including transport and explosives), Surface Support Equipment, TSF Management and Process Plant emissions.

1.98 The following scenarios have been modelled;

- Scenario 1 - Life of Mine Average of 1,717,175 million litres of diesel / annum
- Scenario 2 - Life of Mine Average of 1,717,175 million litres of HVO / annum
- Scenario 3 - Annual Peak of 2,143,407 million litres of diesel / annum
- Scenario 4 - Annual Peak of 2,143,407 million litres of HVO / annum

1.99 The maximum process contribution annual mean NOx concentration and nitrogen deposition (NDep) rate from the DGL emissions occurs at Owenkillew River SAC & ASSI.

1.100 The maximum process contribution annual mean NOx concentration and NDep rate from the DGL emissions at Owenkillew River SAC & ASSI is in excess of the *de-minimis threshold* (DMT) and the *site relevant threshold* (SRT).

1.101 The maximum process contribution annual mean NOx concentration and NDep rate from the DGL emissions at Owenkillew River SAC & ASSI are below the 'Screening Threshold' Test of Likely Significance (ToLS).

1.102 The model outputs showing the predicted NOx concentration and Nitrogen Deposition rates in Tables 9 – 16 indicate the following;

- Scenario 1 indicates that for the Life of Mine Average of 1,717,175 million litres of diesel / annum, the predicted NOx concentration and Nitrogen Deposition rates are below the 'Screening Threshold' Test of Likely Significance (ToLS) at all designated sites.
- Scenario 2 indicates that for the Life of Mine Average of 1,717,175 million litres of HVO / annum, the predicted NOx concentration and Nitrogen Deposition rates are below the 'Screening Threshold' Test of Likely Significance (ToLS) at all designated sites.
- Scenario 3 indicates that for the Annual Peak of 2,143,407 million litres of diesel / annum, the predicted NOx concentration is at the 'Screening Threshold' Test of Likely Significance (ToLS) at the nearest designated site at Owenkillew River. The Nitrogen Deposition rates are below the 'Screening Threshold' Test of Likely Significance (ToLS) at all designated sites.
- Scenario 4 indicates that for the Annual Peak of 2,143,407 million litres of HVO / annum, the predicted NOx concentration and Nitrogen Deposition rates are below the 'Screening Threshold' Test of Likely Significance (ToLS) at all designated sites.

1.103 Therefore, based on the flowchart of the Assessment Procedure, a summary of the assessment findings in terms of impact on ecologically designated sites is as follows;

- **Less than Screening Threshold (Test of Likely Significance) 0.4% => No further AQ Assessment required.**
- Greater than Screening Threshold (SRT) 0.4% => Detailed Assessment required & outline mitigation measures to reduce Process Contributions.

1.104 It can be concluded that the maximum process contribution annual mean NOx concentration and NDep rate from the proposed DGL site will not have a significant impact on annual mean NOx concentration and NDep rate at the nearest sensitive habitats or on designated species.

1.105 There is no predicted NOx or nitrogen deposition impact at the nearest Grid Ref. in the Republic of Ireland at 230042, 388884. This location is 29.1 Km (18 miles) directly west of the proposed Curraghinalt Gold Mine Project site (See Figure 1). Therefore, no transboundary air quality impacts will occur at ecologically designated sites in Co. Donegal and beyond.

4 Conclusions

Conclusions of Predicted Impacts at Human & Ecological Receptors

1.106 The impact of emissions from the proposed DGL site will not be significant on air quality at the nearest residential properties in relation to the relevant Air Quality Standards Regulations.

1.107 There is no predicted exceedance of the relevant ambient air quality standards at the nearest residential properties with the proposed DGL site in operation.

1.108 The impact of emissions from the proposed DGL site will not be significant on air quality at the nearest designated ecological sites in relation to the Screening Threshold (Test of Likely Significance) outlined in the NIEA 'Revised operational protocol for assessing air pollution impacts on the natural environment' (issued 28th February 2025).

1.109 There is no predicted exceedance of the relevant ambient air quality standards at the nearest residential properties or at sensitive ecological receptor locations with the proposed DGL site in operation.

1.110 There is no predicted nitrogen dioxide (NO_2), nitrogen oxide (NOx) or nitrogen deposition impact at the nearest Grid Ref. in the Republic of Ireland at 230042, 388884, located 29.1 Km (18 miles) directly west of the proposed Curraghinalt Gold Mine Project site.

1.111 Therefore, no transboundary air quality impacts will occur at sensitive human receiver locations or at ecologically designated sites in Co. Donegal and beyond.

APPENDIX A

Aermod Air Dispersion Model Outputs

&

Response to the technical issues raised in the Transboundary consultation

Briefing

Curraghinalt, Gortin

November 2025

Response to Transboundary Consultation Representations - Air

Representation Ref[1]	Comment/Issue[2]	Addressed in applicant's submissions to date? [3]	If not, Applicant's Response[4]
An Taisce – pg 20-21	The potential for air pollution from this project arises from the fine particulate matter released from crushing of rock, dust from the dry stack tailings, and diesel fumes from fossil fuel burning (4.3 million litres per annum). Dust from mining operations has been recorded twice as far away as Dalradian's project would be to the ROI border; a study in Finland found fine ore dust of 2.5 particulate matter containing arsenic and mercury, on the leaves of trees 60 Page 21 of 27 kilometres from a goldmine at Kittila. Dalradian's proposed site is approximately 18 miles/30 km from parts of Donegal. The potential for air contaminants to blow across the northwest of the island is exacerbated by the rise in storm frequency and severity due to climate change. The recent Storm Éowyn in Febrary 2025 brought record-breaking gusts of 114mph to Donegal and Galway. No worstcase scenario climate modelling has been done to calculate and therefore mitigate for the risks of air	Yes - as above - Reference - 2017 ES App C19_Air Quality & Dust Impact Assessment. SRK Consulting First Addendum to the ES – C.19	Detailed dust dispersion modelling for dust deposition and particles (PM10 & PM2.5) has been undertaken No significant impact is predicted. (See Air Quality & Dust Impact Assessment. Second Addendum. October 2020). Water bowser mitigation measures and natural rainfall levels will attenuate dust dispersion (See Construction Mitigation Measures - 2017 Air Quality & Dust Impact Assessment and 2019 Addendum. Operational Mitigation Measures - Section 7 in the 2017 Air Quality & Dust Impact Assessment and 2019 Addendum) Storm Éowyns was an exceptional weather event. The storm was accompanied by torrential rainfall which would prevent wind-blown dust in any case.

[1] Give author & TB Reference number & page & paragraph number if possible.
[2] This to be a summary, rather than cut and paste of paragraph(s) but sufficient to identify and explain the issue raised.
[3] This is a yes/no answer. If yes, provide the appropriate reference(s).
[4] This to be a response to the issue raised on the basis that it has not been addressed by us previously.

Turley

	pollution from this project to the health of humans, animals and ecosystems across the north of the island and across the jurisdictions of NI and ROI inclusively	Air Quality Impact Assessment Addendum. SRK Consulting Second Addendum to the ES – C.19 Second Addendum to Air Quality Impact Assessment Addendum (October 2020) & ENV-1532 - DGL Rebuttal Statement 2024 Air Quality 23-11-2024.	Real met data has been used in the modelling to predict the risks of air pollution from this project to the health of humans, animals and ecosystems. An assessment of potential heavy metal impacts from the dry stack has been undertaken based on the particle size and content assay. The particle size assay shows relatively large particle size with only a very trace level of PM2.5 & PM10 particles (See Air Quality & Dust Impact Assessment. Second Addendum. October 2020. Section 3.1.3.5 Commentary on Emission Rate Calculations. Tailings particle size distribution). Therefore, larger particles will deposit in close proximity to the dry stack. In terms of the reference to 4.3 million litres per annum – JDS has clarified Annual Average Fuel Use = 1,717,175 l/yr and Annual Peak Fuel Use = 2,143,407 l/yr during L.O.M. I have prepared a detailed assessment of NOx and NO2 emissions based on the fuel usage values as presented in the Updated Air Quality Impact Assessment (Nov 25) (See Annex to the HRA which is appended to the Ecology TBR). This report concludes that there is no predicted exceedance of the relevant ambient air quality standards at the nearest residential properties with the proposed DGL site in operation. The impact of emissions from the proposed DGL site will not be significant on air quality at the nearest designated ecological sites in relation to the Screening Threshold (Test of Likely Significance) outlined in the NIEA 'Revised operational protocol for assessing air pollution impacts on the natural environment' (issued 28th February 2025).
Environmental Justice Network Ireland – pg 12	air pollution	Yes - as above	Already addressed in assessments and rebuttals to date.
pg 17	Among the heavy metals to be discharged into the Owenkillew River and Owenreagh River include cadmium (known for its accumulation in the food chain, drinking water and soil), arsenic, lead, chromium and mercury, which can remain suspended in air due to its volatile nature. For example, in the Rio Tinto in Spain,	Yes - as above	Already addressed in assessments and rebuttals to date. An assessment of potential heavy metal air quality impacts from the dry stack particulate emissions has been undertaken. This has been based on the particle size and

	pollution from copper mining has lasted over 5,000 years. Given the findings of the independent environmental and ecology assessments in relation to the impact on water quality and ecology, this is highly concerning. A world-renowned mining and groundwater expert, Dr Steven Emerman, has queried the methodology for the mine waste facility and lack of design flood in Dalradian Gold's plans. The parameters and scope of the Dalradian project continue to shapeshift in what can only be interpreted as a means of ensuring planning permission at all costs.		content assay. (See Air Quality & Dust Impact Assessment. Second Addendum. October 2020. Section 3.1.3.5 Commentary on Emission Rate Calculations. Tailings particle size distribution).
Sample Objection Letter 2 -og 1	The waste would be stacked in the "Dry Stack Facility" which Dalradian states would need to be sprayed with water to prevent the dust, containing heavy metals such as arsenic, mercury, lead, cadmium, chromium, etc, from blowing in the wind. On the other hand, they also state it would have to be kept dry to prevent Acid Mine Drainage from forming. (That is a dilemma for them, how to keep it wet and dry at the same time!) Dalradian's proposed elevated site in the Sperrin mountains experiences strong winds as well as heavy rainfall. When dry, the toxic dust could be blown across the island of Ireland. When wet it could leach into the water table. A study in Finland found the fine dust, 2.5 particulate matter containing arsenic and mercury, had blown on to the leaves of trees 60 kilometres from a goldmine at Kittila. Jari Natunen, a Finnish Biochemist, said that this fine particulate matter was very dangerous as it could enter people's lungs causing respiratory diseases and cancers and that children are particularly vulnerable. (*Explosives release Ammonium nitrate which is poisonous to humans and the environment)	Yes - as above	Dust dispersion will be limited because the tailings will have a water content of approx. 13%. (See Air Quality & Dust Impact Assessment. Second Addendum. October 2020. Section 3.1.3 Dust Emission Rate Calculations) The use of a water bowser with a modest amount of water spreading will also control windblown dusts The extent of the local rainfall volumes will allow for adequate dust control -> in excess of 100 days per annum with significant rainfall (>0.2mm). An assessment of potential heavy metal impacts from the dry stack has been undertaken. (See Air Quality & Dust Impact Assessment. Second Addendum. October 2020. Section 5.2.4 Discussion of Predicted Metal Deposition Rates & Concentrations from DSF Operations)
Pg 2	Dalradian's proposed site is approximately 18 miles/30 km from parts of Donegal so all the poisonous contaminants from the waste dust, explosives, radon gas and diesel emissions can be easily transported by air. People remember the sand from the Sahara desert and the red dust from the Aughinish aluminium mine in Limerick blowing over the whole country. Air, like water, doesn't stop at borders!	Yes - as above - ENV-1532 - DGL Rebuttal Statement 2024 Air Quality 23-11-2024	The Met Office states that Saharan dust is relatively common in the UK, often happening several times a year when big dust storms in the Sahara coincide with southerly wind patterns. The Saharan dust particles are aerosols. Their particle size is a maximum of 1,100 nm or 1.1 µm. This is much smaller particle size than found in the DGL particle assay. The Updated Air Quality Impact Assessment (Nov 25) indicates no air quality impact in RoI.
Cllr [redacted] – pg 1	Dust containing particulate matter (PM10 and PM2.5) from mining activities can travel significant distances, as shown by a 2019 study in Environmental Research Letters. Long-term exposure to PM2.5 is directly associated with increased cardiovascular and respiratory mortality, as documented by the European Heart Journal (2019).	Yes - as above	We have already dealt with dust dispersion assessment in detail, mitigation measures and the fact that a tiny percentage of the tailings is of PM10 and PM2.5 particle size.

Loughs Agency – pg 95 par 21.11	"Loughs Agency strongly disagrees that implications from blasting would be limited to the lower reaches of the Pollanroe Burn. Upstream impacts such as dust deposition have the potential to impact other species such as macroinvertebrates which are a food source for Atlantic salmon, reducing the availability of food for Atlantic salmon."	Yes - as above	Dust can have two types of effect on vegetation: physical and chemical. Direct physical effects include reduced photosynthesis, respiration and transpiration through smothering. Chemical changes to soils or watercourses may lead to a loss of plants or animals via changes in acidity. These changes are likely to occur only as a result of long-term works adjacent to a sensitive habitat. The project ecologist has assessed dust impacts on sensitive habitats and plants in the study area.
1501 - Friends of the Earth (JO) – pg 2	The A5 and Goldmine have not been assessed in combination for their climate impacts and emissions of nitrogen.	No	The A5 road is greater than 15 Km (10 miles) from the Goldmine site. There will be no significant in combination or cumulative impact in terms of climate impacts and emissions of nitrogen. The A5 road already exists and a very similar future traffic volume, with or without the scheme development, will emit a very similar level of CO2 and NOx emissions to the proposed route. The background AQ surveys have assessed local air quality which would have taken account of the impact of emissions from the existing A5 road, if any at such a significant separation distance.
Pg 2	Volatile and extreme weather events associated with climate breakdown are likely to distribute toxic air and contaminated water to RoI (from stack emissions and tailings failure) and these extreme weather implications have not been assessed.	Yes - as above	Real met data has been used in the modelling to predict air pollutant concentrations and deposition rates from this project and assess the impact to the health of humans, animals and ecosystems. The dispersion modelling has shown negligible impact beyond 2 Km from the site. The particle size assay as well as the proposal for the use of the water bowser when required and the inherent 13% moisture content of the dry stack will attenuate any potential for significant dust emissions.
Pg 2	No assessment of the impact of wildfires and ammonia deposition on the carbon resilience of peatlands around the Irish border.	No	Wildfire impacts, even if they did occur, would be independent from the mine proposals and a significant wildfire will result in far greater emissions than the proposed mine.

			DGL propose that Subtek Velcro is the explosives product that will be used in the mine, which is a water-based emulsion. Significant advancement in modern Ammonium Nitrate (AN) based emulsions can be formulated to have a near-optimal oxygen balance, significantly reducing NOx emissions compared to older technologies, by as much as 40 times less. Ammonia (NH3) is not emitted from well managed fully detonated emulsion explosives. The Updated Air Quality Impact Assessment (Nov 25) includes nitrogen oxides (NOx) dispersion modelling and air quality impact assessment in accordance with the methodology outlined in the NIEA Revised Operational Protocol for Assessing Ammonia and Air Pollution Impacts on the Natural Environment (issued by NIEA on 28th February 2025). This report concludes that there is no predicted exceedance of the relevant ambient air quality standards at the nearest residential properties with the proposed DGL site in operation. The impact of emissions from the proposed DGL site will not be significant on air quality at the nearest designated ecological sites in relation to the Screening Threshold (Test of Likely Significance) outlined in the NIEA 'Revised operational protocol for assessing air pollution impacts on the natural environment' (issued 28th February 2025).
TBA1502 RABHARTA - Pg 4	Nitrate and Ammonia contamination	Yes - as above	As stated above, DGL propose that Subtek Velcro is the explosives product that will be used in the mine which is a water-based emulsion. Ammonia (NH3) is not emitted from well managed fully detonated emulsion explosives. The Updated Air Quality Impact Assessment (Nov 25) includes nitrogen oxides (NOx) dispersion modelling and air quality impact assessment in accordance with the methodology outlined in the NIEA Revised Operational Protocol for Assessing Ammonia and Air Pollution Impacts on the Natural Environment (issued by NIEA on 28th February 2025).(See Annex to the HRA which is appended to the Ecology TBR)

TBA0143 [redacted] Farm- - pg 1	Dust from the mine could blow across the border spreading arsenic. Diesel fumes and radon gas from mining will also damage air quality and increase health risks for children and older people.	Yes - as above	Real met data has been used in the modelling to predict air pollutant concentrations and deposition rates from this project and assess the impact to the health of humans, animals and ecosystems. (See Air Quality & Dust Impact Assessment. Second Addendum. October 2020 & Updated Air Quality Impact Assessment (Nov 25)The dispersion modelling has shown negligible impact beyond 2 Km from the site. (See Air Quality & Dust Impact Assessment. Second Addendum. October 2020 & Updated Air Quality Impact Assessment (Nov 25) The particle size assay as well as the proposal for the use of the water bowser when required and the inherent 13% moisture content of the dry stack will attenuate any potential for significant dust emissions. Radon is addressed separately.
TBA0322 – pg 1	The mine site is just 30km from parts of Donegal. Evidence from Finland, where toxic mine dust has travelled over 60km, shows us that arsenic, mercury and other contaminants do not respect borders.	Yes - as above	See response to similar objection above.
TBA0360 – pg 1	The use of toxic chemicals such as cyanide and mercury in goldmining is well-documented to cause long-term damage to land, air and water. Contamination from the mine could impact ecosystems, farmland, rivers, and drinking water supplies in neighbouring counties	Yes - as above	There is no proposal for cyanide and mercury use.
TBA0412 – pg 1	Radon gas diesel fumes and arsenic can contaminate the air we breathe causing multiple health issues.	Yes - as above	Real met data has been used in the modelling to predict air pollutant concentrations and deposition rates from this project and assess the impact to the health of humans, animals and ecosystems. The dispersion modelling has shown negligible impact beyond 2 Km from the site. The particle size assay as well as the proposal for the use of the water bowser when required and the inherent 13% moisture content of the dry stack will attenuate any potential for significant dust emissions. Radon issues are addressed elsewhere.

			The proposed use of electric powered conveyors will reduce vehicle usage in terms of transport from mine to processing building. In the 2019 Addendum, the additional road traffic movements anticipated during the operational phase versus the 'Base AADT' flows indicate that the traffic increases during the operation phase are below the level of change requiring further assessment against both DMRB and EPUK criteria. The 2019 Addendum states that there will be 13 HGV two-way movements per day, i.e. 26 HGV movements daily. LGV and car journeys are predicted to be 123 movements during AM Peak and PM Peak, i.e. 246 LGV and car journeys daily. Therefore, in total, there will be <100 HGV movements daily and <500 LDV movements daily. Mine vent and portal emissions have been assessed.
TBA0506 Wild Ireland Defence – pg 1	Dalradian has applied to use 3.5million litres of diesel on site every year for the duration of the mine - the pollution potential of this has not been adequately measured in their EIA.	Yes - as above	In terms of the reference to 4.3 million litres per annum – JDS has clarified Annual Average Fuel Use = 1,717,175 l/yr and Annual Peak Fuel Use = 2,143,407 l/yr during L.O.M. I have prepared a detailed assessment of NOx and NO2 emissions based on the fuel usage values. This is assessed in the Updated Air Quality Impact Assessment (Nov 25).
Pg 1	I suggest that we get a detailed breakdown of the suggested 4.3 or 3.5 million litres per annum? These two numbers are consistently raised by objectors. What level of fuel usage was there during the Exploration Stage? this would have been assessed during the 1-year baseline AQ surveys. This issue arises in a few replies and we do need to prepare a detailed assessment.	Yes - as above	In terms of the reference to 4.3 million litres per annum – JDS has clarified Annual Average Fuel Use = 1,717,175 l/yr and Annual Peak Fuel Use = 2,143,407 l/yr during L.O.M. I have prepared a detailed assessment of NOx and NO2 emissions based on the fuel usage values. This is assessed in the Updated Air Quality Impact Assessment (Nov 25).
TBA0596 – pg 1-2	Dalradian proposes to store the waste in a huge 54 metres high, 1 "Dry Stack Facility" to store their waste over the proposed 25 year life of the mine and in perpetuity thereafter. When thousands of tons of rock are removed from the mine by the use of explosive twice daily. Dalradian state that the rock will be crushed into the fine consistency of flour and floated in a 'simple chemical solution' to remove the gold ore. The waste would need to be separated with water to prevent the dust, containing heavy metals such as arsenic, mercury, lead, cadmium, chromium etc from blowing in the wind. One the other hand, they also state it	Yes - as above	Real met data has been used in the modelling to calculate and therefore mitigate for the risks of air pollution from this project to the health of humans, animals and ecosystems. The dispersion modelling has shown compliance with all relevant air quality limit values off site and a negligible impact beyond 2 Km from the site. The particle size assay as well as the proposal for the use of the water bowser when required and the inherent 13%

	would have to be kept dry to prevent Acid Mine Drainage from forming. Dalradians proposed elevated site in the Sperrin Mountains experiences strong winds as well as heavy rainfall. When dry, the toxic dust could be blown across the island of Ireland. When wet it could leach into the water table.		moisture content of the dry stack will attenuate any potential for significant dust emissions.
Pg2	A study in Finland found the fine dust, 2.5 particulate matter containing arsenic and mercury, had blown on to the leaves of trees 60 kilometres from a goldmine at Kittila. Jari Natunen, a Finnish Biochemist, said that this fine particulate matter was very dangerous as it could enter people's lungs causing respiratory diseases and cancers and that children are particularly vulnerable.	Yes - as above	A very small percentage of the tailings is in the PM10 and PM2.5 particle size range, i.e. <5%. Therefore, with the proposed mitigation measures and mixing and covering with larger particles in the DSF, there is no potential for significant wind blown fine particulate matter impact.
Pg 2	It is well documented that high levels of fumes from diesel emissions are poisonous - leading to increased rates of lung cancer, other heart and lung diseases and premature death. Dalradian has applied to use 3.5 million litres of diesel onsite every year for 25 years - the implications of this on human, animal and plant life has not been measured in their EIA.	Yes - as above	In terms of the reference to 4.3 million litres per annum – JDS has clarified Annual Average Fuel Use = 1,717,175 l/yr and Annual Peak Fuel Use = 2,143,407 l/yr during L.O.M. I have prepared a detailed assessment of NOx and NO2 emissions based on the fuel usage values. This is assessed in the Updated Air Quality Impact Assessment (Nov 25).
Pg 2-3	Dalradian site is 30km from parts of Donegal so all the poisonous contaminants from the waste dust, explosives, radon gas and diesel emissions can be easily transported by air.	Yes - as above	Real met data has been used in the modelling to calculate and therefore mitigate for the risks of air pollution from this project to the health of humans, animals and ecosystems. The dispersion modelling has shown negligible impact beyond 2 Km from the site. T he particle size assay as well as the proposal for the use of the water bowser when required and the inherent 13% moisture content of the dry stack will attenuate any potential for significant dust emissions.
Pg 7	Toxic dust would settle on the grass that is eaten by cattle, sheep and other farm animals.	Yes - as above	Assessed in the Health Impact Assessment (See Health Impact Assessment is at C14 of the ES and the ES addendum (2019))
Pg 7	Toxic dust would settle on the grass that is eaten by cattle, sheep and other farm animals. Animals and crops would be affected by the contaminated water and toxic dust from the proposed goldmine so that milk and other farm produce would no longer be fit for human consumption and could not be sold. This would have a significant adverse impact on the livelihood of farmers and farm families not just in counties Tyrone, Derry and Donegal but across other counties in the Republic who rely on their farm produce - such as beef, dairy, chicken, eggs and crops - for their economic viability.	Yes - as above	Assessed in the Health Impact Assessment (See Health Impact Assessment is at C14 of the ES and the ES addendum (2019))

TBA0741 – pg 1	Research has shown that toxic dust, including particles of arsenic and mercury can travel more than 60km from goldmining sites. This raises serious alarms about transboundary air pollution and consequences for communities downwind.	Yes - as above	A very small percentage of the tailings is in the PM10 and PM2.5 particle size range, i.e. <5%. Therefore, with the proposed mitigation measures and covering with larger particles, there is no potential for significant wind blown fine particulate matter impact.
TBA0751 – pg 1	The air pollution caused by toxic dust knows no political borders and will spread up to 60km beyond the Sperrins in to the Republic of Ireland.	Yes - as above	Real met data has been used in the modelling to calculate and therefore mitigate for the risks of air pollution from this project to the health of humans, animals and ecosystems. The dispersion modelling has shown compliance with all relevant air quality limit values off site and a negligible impact beyond 2 Km from the site. The particle size assay as well as the proposal for the use of the water bowser when required and the inherent 13% moisture content of the dry stack will attenuate any potential for significant dust emissions.
TBA0756 - Raphoe JPIC Committee Letterkenny – pg 1	Opposed to Dalradian's goldmine in the AONB because there is no safe way to mine without damaging the local environment, including air and water quality.	Yes - as above	Real met data has been used in the modelling to calculate and therefore mitigate for the risks of air pollution from this project to the health of humans, animals and ecosystems. The dispersion modelling has shown compliance with all relevant air quality limit values off site and a negligible impact beyond 2 Km from the site. The particle size assay as well as the proposal for the use of the water bowser when required and the inherent 13% moisture content of the dry stack will attenuate any potential for significant dust emissions.
TBA0775; TBA0987; TBA1465; TBA0630 – pg 1	Dust from the mine could blow across the border, spreading harmful substances like arsenic. Diesel fumes and radon gas from mining will also damage air quality and increase health risks, especially for children and older people.	Yes - as above	Real met data has been used in the modelling to calculate and therefore mitigate for the risks of air pollution from this project to the health of humans, animals and ecosystems. The dispersion modelling has shown compliance with all relevant air quality limit values off site and a negligible impact beyond 2 Km from the site. The particle size assay as well as the proposal for the use of the water bowser when required and the inherent 13% moisture content of the dry stack will attenuate any potential for significant dust emissions. Assessed in the Health Impact Assessment.

TBA0872 – pg1	We only have one planet and the daily use of chemicals in mining operations will have detrimental effects on the land, waterways and air quality in the surrounding area. It will poison our wildlife, water supplies and the communities living nearby.	Yes - as above	As above
TBA1247 – pg 1	The toxic dust plumes will be a present danger, spreading by air uncontrollably for miles in all directions. The particulate matter involved will pollute air, water, grassland and settled land.	Yes - as above	As above
TBA1487 – pg2-3	Consider the impact of the proposed 54m high DSF which would store waste for the 25 year life of the mine and in perpetuity. There would be fine dust floating in the air.	Yes - as above	As above
TBA1490 – pg 2-4	The proposed location of the mine and dry stack is elevated and exposed, the profile of the Sperrins offering little by way of shelter or protection from the windy conditions. NI is recognised by the World Bank as having some of the highest sustained winds across the globe (see images). This increases the risk of air pollution via dust particles.	Yes - as above	Real met data has been used in the modelling to calculate and therefore mitigate for the risks of air pollution from this project to the health of humans, animals and ecosystems. The dispersion modelling has shown compliance with all relevant air quality limit values off site and a negligible impact beyond 2 Km from the site. The particle size assay as well as the proposal for the use of the water bowser when required and the inherent 13% moisture content of the dry stack will attenuate any potential for significant dust emissions.
Pg 4	The air pollution has potential to contaminate fresh drinking water sources in the Sperrins such as Lough Fea and Banagher/Altnaheglish Reservoir	No	Banagher/Altnaheglish Reservoir is 22.5 Km north-east of the DGL site. Lough Fea is 17 Km east of the DGL site. Based on the results of the dust and nitrogen oxides (NOx) dispersion model and impact assessment there will be no impact at these locations which are a very significant distance from the DGL site.
TBA1494 – pg 9	It is well documented that high levels of fumes from diesel emissions are poisonous - leading to increased rates of lung cancer, other heart and lung diseases and premature death. Dalradian has applied to use 3.5 million litres of diesel onsite every year for 25 years - the implications of this on human, animal and plant life has not been measured in their EIA.	Yes - as above	In terms of the reference to 4.3 million litres per annum – JDS has clarified Annual Average Fuel Use = 1,717,175 l/yr and Annual Peak Fuel Use = 2,143,407 l/yr during L.O.M. I have prepared a detailed assessment of NOx and NO2 emissions based on the fuel usage values. This is assessed in the Updated Air Quality Impact Assessment (Nov 25).
TBA1495 – pg 3	The elevated location of the DSF experiences strong winds and heavy rain. When dry, the dust could be blown across the island, when wet if could leach in to the water table.	Yes - as above	Real met data has been used in the modelling to calculate and therefore mitigate for the risks of air pollution from this project to the health of humans, animals and ecosystems.

			The dispersion modelling has shown compliance with all relevant air quality limit values off site and a negligible impact beyond 2 Km from the site. The particle size assay as well as the proposal for the use of the water bowser when required and the inherent 13% moisture content of the dry stack will attenuate any potential for significant dust emissions. The impact of leaching into the water table has been assessed by others.
Pg 3	Implications of the use of diesel on the site on human, animal and plant life has not been measured in the ES.	Yes - as above	In terms of the reference to 4.3 million litres per annum – JDS has clarified Annual Average Fuel Use = 1,717,175 l/yr and Annual Peak Fuel Use = 2,143,407 l/yr during L.O.M. A detailed assessment of NOx and NO2 emissions based on the fuel usage values has been prepared, which includes an assessment of the future use of both diesel and HVO (Hydrotreated Vegetable Oil). This is assessed in the Updated Air Quality Impact Assessment (Nov 25).
TBA 1496 – pg 5-6	Impact of dust on health of animals	Yes - as above	Assessed in the Health Impact Assessment.
Pg 18	Diesel emissions and particulate matter	Yes - as above	In terms of the reference to 4.3 million litres per annum – JDS has clarified Annual Average Fuel Use = 1,717,175 l/yr and Annual Peak Fuel Use = 2,143,407 l/yr during L.O.M. I have prepared a detailed assessment of NOx and NO2 emissions based on the fuel usage values. This is assessed in the Updated Air Quality Impact Assessment (Nov 25).
TBA1539 - Save our Sperrins – pg 5	Use of explosives twice daily for 25 years for 900m deep mine. Explosive relate ammonium nitrate which is poisonous to humans and the environment.	Yes - as above	DGL propose that Subtek Velcro is the explosives product that will be used in the mine which is a water-based emulsion. Significant advancement in modern Ammonium Nitrate (AN) based emulsions can be formulated to have a near-optimal oxygen balance, significantly reducing NOx emissions compared to older technologies. Ammonia (NH3) is not emitted from well managed fully detonated emulsion explosives. A nitrogen oxides (NOx) dispersion modelling and air quality impact assessment for the proposed DGL Curraghinalt Project has been prepared in accordance with the methodology outlined in the Northern Ireland

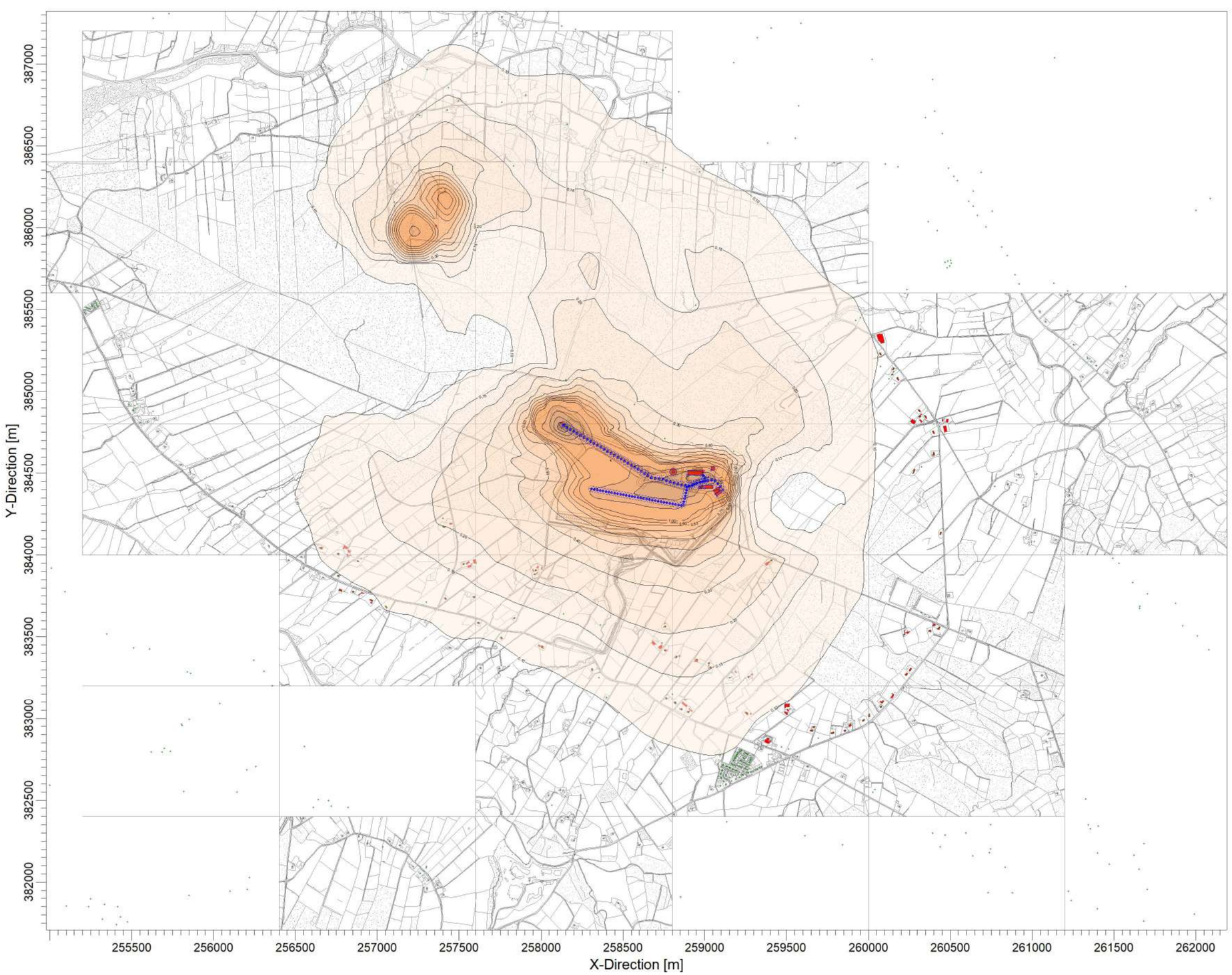
			Environment Agency (NIEA) Revised Operational Protocol for Assessing Ammonia and Air Pollution Impacts on the Natural Environment (issued by NIEA on 28th February 2025).
Pg 5	Heavy wind will blow dust from the DSF	Yes - as above	As above
Pg 6	Diesel emissions and particulate matter	Yes - as above	In terms of the reference to 4.3 million litres per annum – JDS has clarified Annual Average Fuel Use = 1,717,175 l/yr and Annual Peak Fuel Use = 2,143,407 l/yr during L.O.M. I have prepared a detailed assessment of NOx and NO2 emissions based on the fuel usage values. This is assessed in the Updated Air Quality Impact Assessment (Nov 25). Detailed dust dispersion modeling for dust deposition and particles (PM10 & PM2.5) has been undertaken. No significant impact predicted. Water bowser mitigation measure and natural rainfall levels will attenuate dust dispersion.
TBA1564 - Ecojustice Ireland – pg 4	Toxic dust would be blown across the Irish border from the DSF	Yes - as above	Detailed dust dispersion modeling for dust deposition and particles (PM10 & PM2.5) has been undertaken. No significant impact predicted. Water bowser mitigation measure and natural rainfall levels will attenuate dust dispersion.
Pg 4	Radon gas may be released by the mine causing radioactive contaminants in the air.	Yes - as above	Radon addressed by other experts
Pg 4	impact from diesel emissions on humans, animal and plant life has not be assessed.	Yes - as above	In terms of the reference to 4.3 million litres per annum – JDS has clarified Annual Average Fuel Use = 1,717,175 l/yr and Annual Peak Fuel Use = 2,143,407 l/yr during L.O.M. I have prepared a detailed assessment of NOx and NO2 emissions based on the fuel usage values. This is assessed in the Updated Air Quality Impact Assessment (Nov 25).
TBA1581 - Jesuit Centre for Faith & Justice- pg 2	Dalradian has applied to build a 54m high Dry Stack Facility to store their waste over the proposed 25 year life of the mine and in perpetuity thereafter. When the thousands of tons of rock are removed from the mine by the use of explosives twice daily, Dalradian state that the rock will be crushed into the fine consistency of flour and floated in a simple chemical solution to remove the gold ore... The proposed elevated site of the Sperrin mountains experiences strong winds as well as heavy rainfall. When dry, toxic dust could be blown across the island of Ireland.	Yes - as above	Detailed dust dispersion modeling for dust deposition and particles (PM10 & PM2.5) has been undertaken. No significant impact predicted. Water bowser mitigation measure and natural rainfall levels will attenuate dust dispersion.

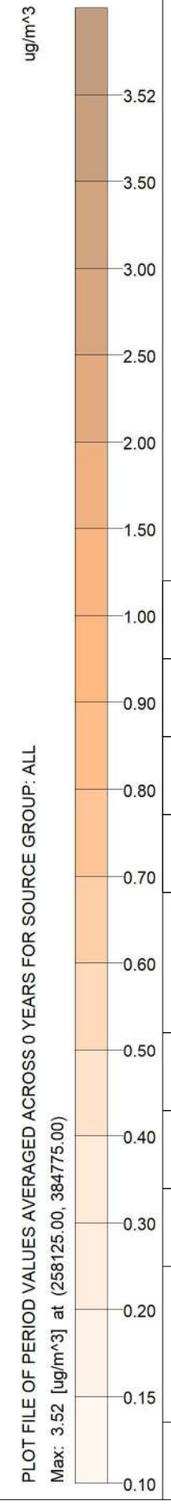
Pg 3	It is well documented that high levels of fumes from diesel emissions are poisonous - leading to increased rates of lung cancer, other heart and lung diseases and premature death. Dalradian has applied to use 3.5 million litres of diesel onsite every year for 25 years - the implications of this on human, animal and plant life has not been measured in their EIA.	Yes - as above	In terms of the reference to 4.3 million litres per annum – JDS has clarified Annual Average Fuel Use = 1,717,175 l/yr and Annual Peak Fuel Use = 2,143,407 l/yr during L.O.M. I have prepared a detailed assessment of NOx and NO2 emissions based on the fuel usage values. This is assessed in the Updated Air Quality Impact Assessment (Nov 25).
TBA1583 - Rights of Nature Donegal – pg4	The proposed mining activities would involve the crushing of rocks into very fine particles. In the process those same heavy metals would be released and would become airborne. Not only would this be a serious health risk but given that the wind, like other natural forces does not recognise political boundaries, would also pose a serious threat to those living down wind of mining operations in Donegal.	Yes - as above	Detailed dust dispersion modeling for dust deposition and particles (PM10 & PM2.5) has been undertaken. No significant impact predicted. Water bowser mitigation measure and natural rainfall levels will attenuate dust dispersion.
TBA1584 – pg2	Toxic dust would be blown across the Irish border from the DSF	Yes - as above	As above
Pg 3	Diesel emissions and particulate matter	Yes - as above	As above
TBA1585 – pg13	Toxic dust would be blown across the Irish border from the DSF	Yes - as above	As above
Pg 14	Diesel emissions and particulate matter	Yes - as above	As above
TBA1592 - Centre for Global Education pg 5	Diesel emissions and particulate matter	Yes - as above	As above
TBA1597 - Ireland's Think-tank for Action on Social Change pg 5-6	Toxic dust would be blown across the Irish border from the DSF	Yes - as above	As above
Pg 6	Diesel emissions and particulate matter	Yes - as above	As above
TBA0594 pg 1	Dust from the mine could blow across the border, spreading harmful substances like arsenic. Diesel fumes and radon gas from mining will damage air quality and increase health risks, especially for children and older people.	Yes - as above	As above
TBA1576 - Save inis Eoghain pg 7	The proposed mining activities would involve the crushing of rocks into very fine particles. In the process those same heavy metals would be released and would become airborne. Not only would this be a serious health risk but given that the	Yes - as above	As above

	wind , like other natural forces does not recognise political boundaries, would also pose a serious threat to those living down wind of mining operations in Donegal.		
TBA1566 pg 9	Dust from the mine could blow across the border, spreading harmful substances like arsenic. Diesel fumes and radon gas from mining will damage air quality and increase health risks, especially for children and older people.	Yes - as above	As above
New Template Letter pg 1	Toxic dust would be blown across the Irish border from the DSF	Yes - as above	As above
		Yes - as above	

PROJECT TITLE:

Figure 1: Curraghinalt Project, Dalradian Gold Ltd. Nitrogen Oxide (NOx) emissions - Scenario 1 - Life of Mine Average of 1,717,175 million litres of diesel / annum. NOx EAL = 30 ug/m3 [from Air Quality Standards]. To convert to Nitrogen Deposition Rate (kg/ha/yr), Conversion Rate = NOx conc x 0.1425 [From AQTAG06]. Nitrogen Deposition Critical Loads for habitat type - 'Bogs' & 'Wet woodland' is 5 kg/ha/yr, 'Oakwood' is 10





COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

2187

OUTPUT TYPE:

Concentration

MAX:

3.52 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

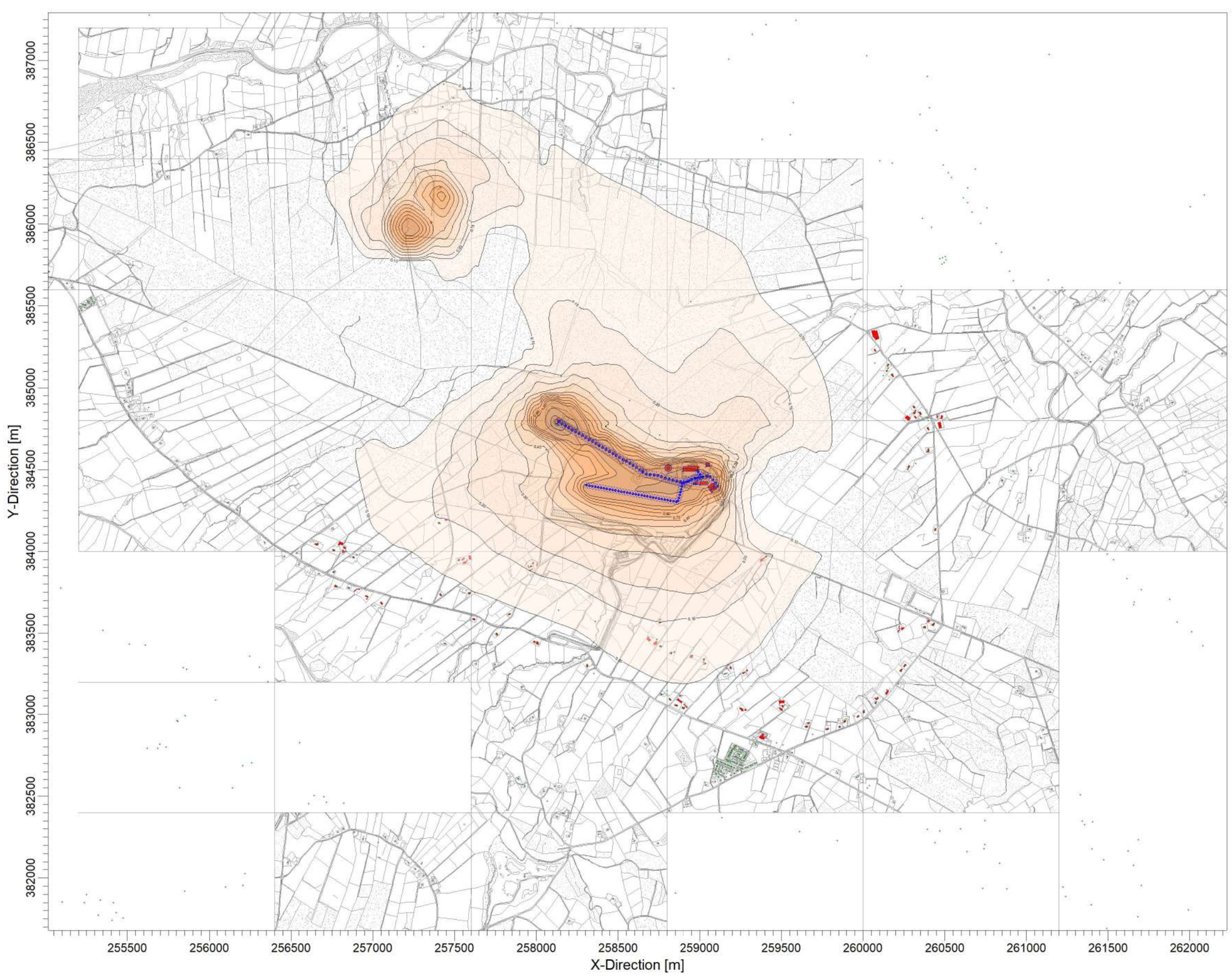
0 0.5 km

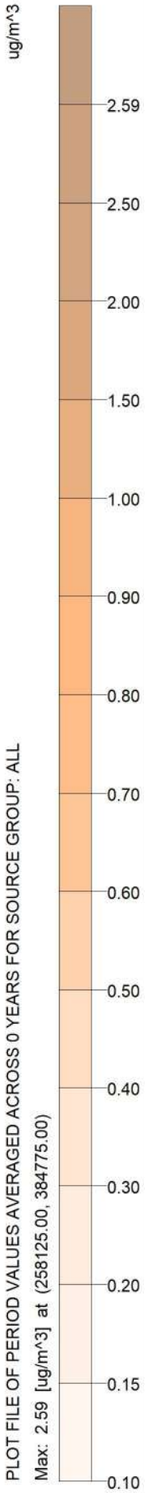
PROJECT NO.:

ENV-1532

PROJECT TITLE:

Figure 2: Curraghinalt Project, Dalradian Gold Ltd. Nitrogen Oxide (NOx) emissions - Scenario 2 - Life of Mine Average of 1,717,175 million litres of HVO / annum. NOx EAL = 30 ug/m3 [from Air Quality Standards]. To convert to Nitrogen Deposition Rate (kg/ha/yr), Conversion Rate = NOx conc x 0.1425 [From AQTAG06]. Nitrogen Deposition Critical Loads for habitat type - 'Bogs' & 'Wet woodland' is 5 kg/ha/yr, 'Oakwood' is 10





COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

2187

OUTPUT TYPE:

Concentration

MAX:

2.59 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

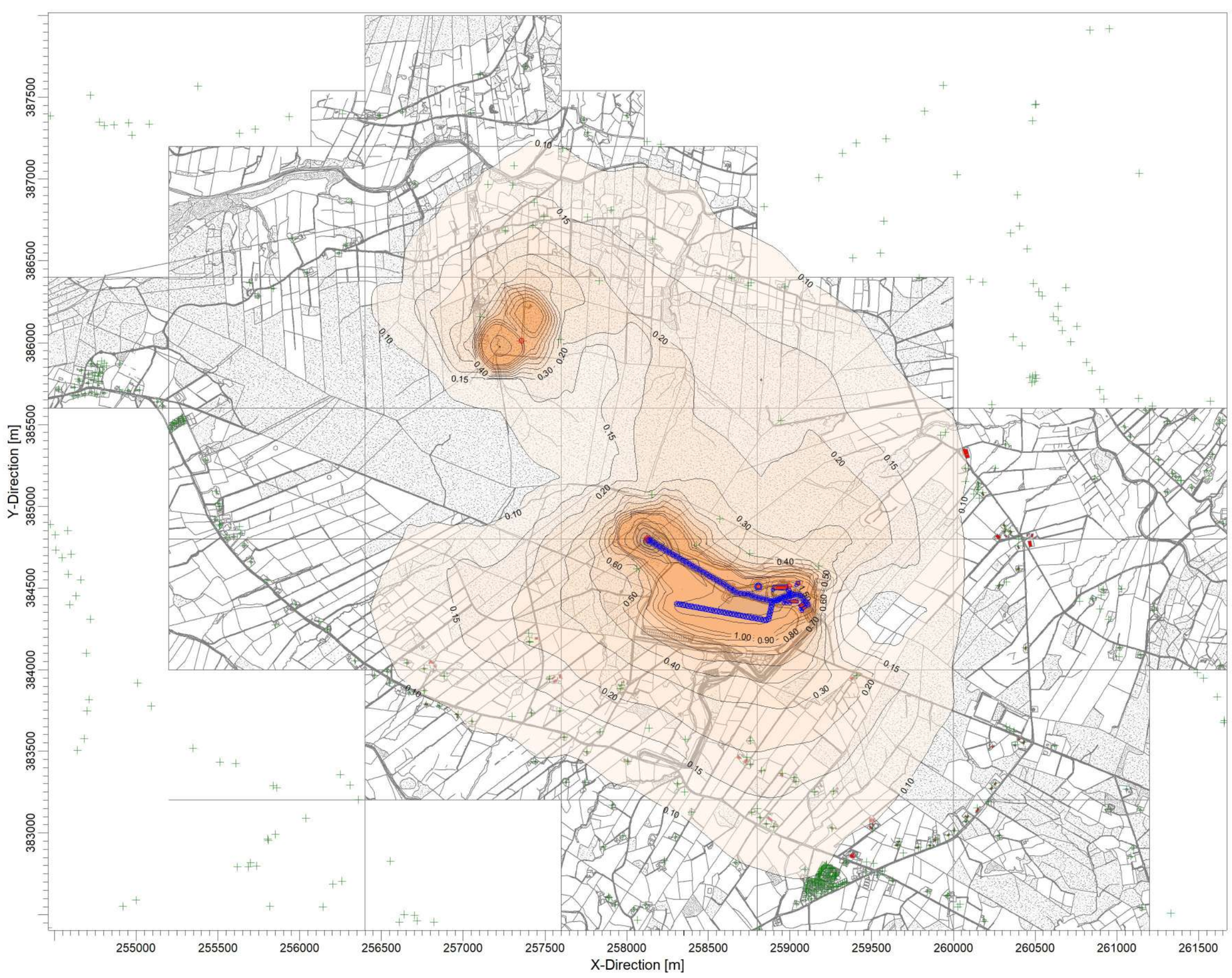
0 0.5 km

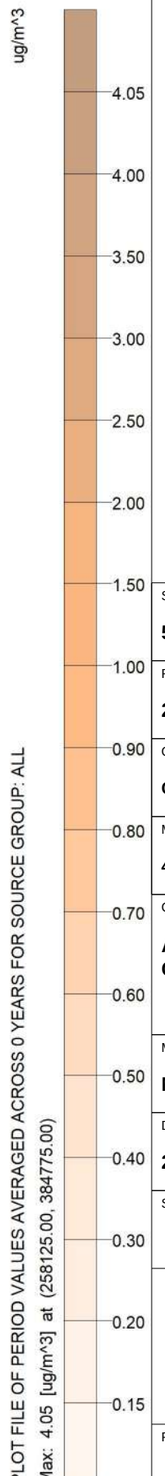
PROJECT NO.:

ENV-1532

PROJECT TITLE:

Figure 3: Curraghinalt Project, Dalradian Gold Ltd. Nitrogen Oxide (NOx) emissions - Scenario 3 - Annual Peak of 2,143,407 million litres of diesel / annum. NOx EAL = 30 ug/m3 [from Air Quality Standards].
To convert to Nitrogen Deposition Rate (kg/ha/yr), Conversion Rate = NOx conc x 0.1425 [From AQTAG06]. Nitrogen Deposition Critical Loads for habitat type - 'Bogs' & 'Wet woodland' is 5 kg/ha/yr, 'Oakwood' is 10





COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

2187

OUTPUT TYPE:

Concentration

MAX:

4.05 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

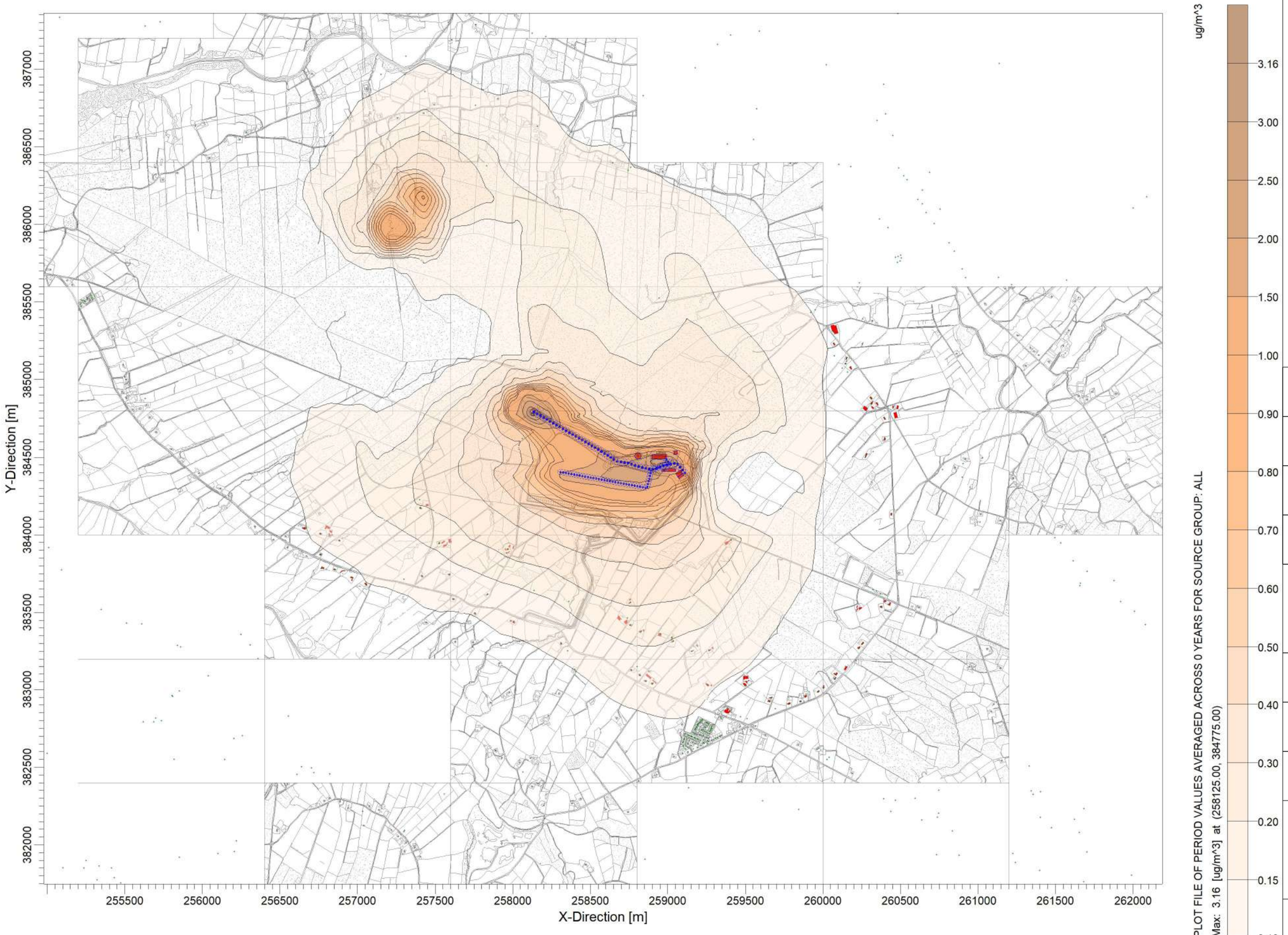
0 0.5 km

PROJECT NO.:

ENV-1532

PROJECT TITLE:

Figure 4: Curraghinalt Project, Dalradian Gold Ltd. Nitrogen Oxide (NOx) emissions - Scenario 4 - Annual Peak of 2,143,407 million litres of HVO / annum. NOx EAL = 30 ug/m3 [from Air Quality Standards].
To convert to Nitrogen Deposition Rate (kg/ha/yr), Conversion Rate = NOx conc x 0.1425 [From AQTAG06]. Nitrogen Deposition Critical Loads for habitat type - 'Bogs' & 'Wet woodland' is 5 kg/ha/yr, 'Oakwood' is 10



COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

2187

OUTPUT TYPE:

Concentration

MAX:

3.16 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

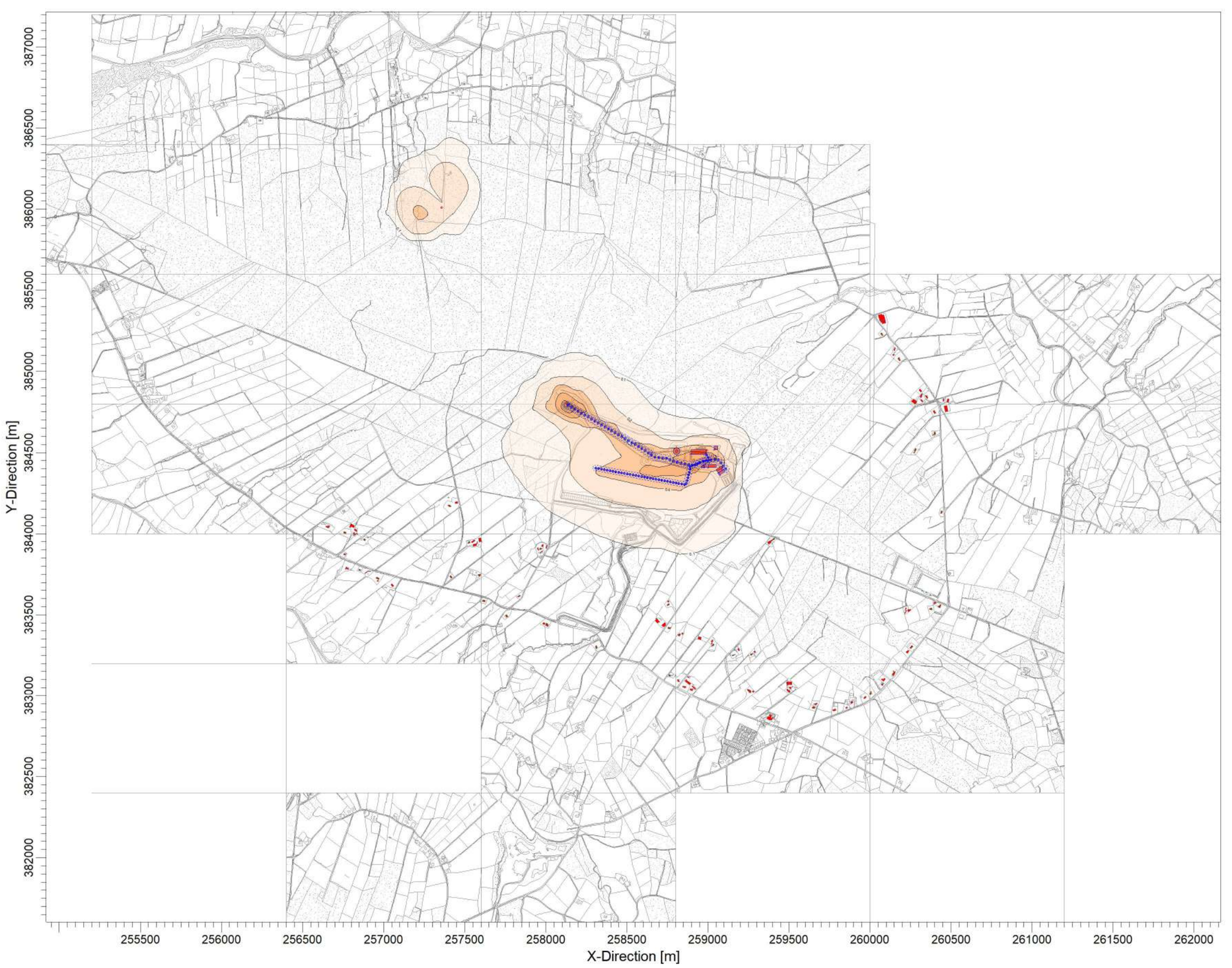
0 0.5 km

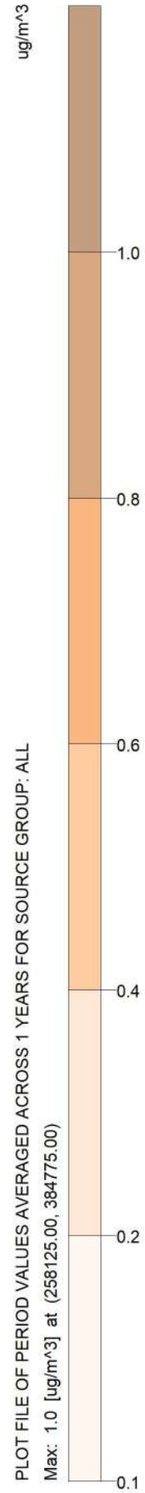
PROJECT NO.:

ENV-1532

PROJECT TITLE:

Figure 5: Curraghinalt Project, Dalradian Gold Ltd. Annual Mean Nitrogen Dioxide (NO2) emissions from Underground Mining sources, Surface Support Equipment, TSF Management and Process Plant emissions. Scenario 1 - Life of Mine Average of 1,717,175 million litres of diesel / annum. NO2 EAL = 40 ug/m3 [from Air Quality Standards].





COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

1465

OUTPUT TYPE:

Concentration

MAX:

1.0 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

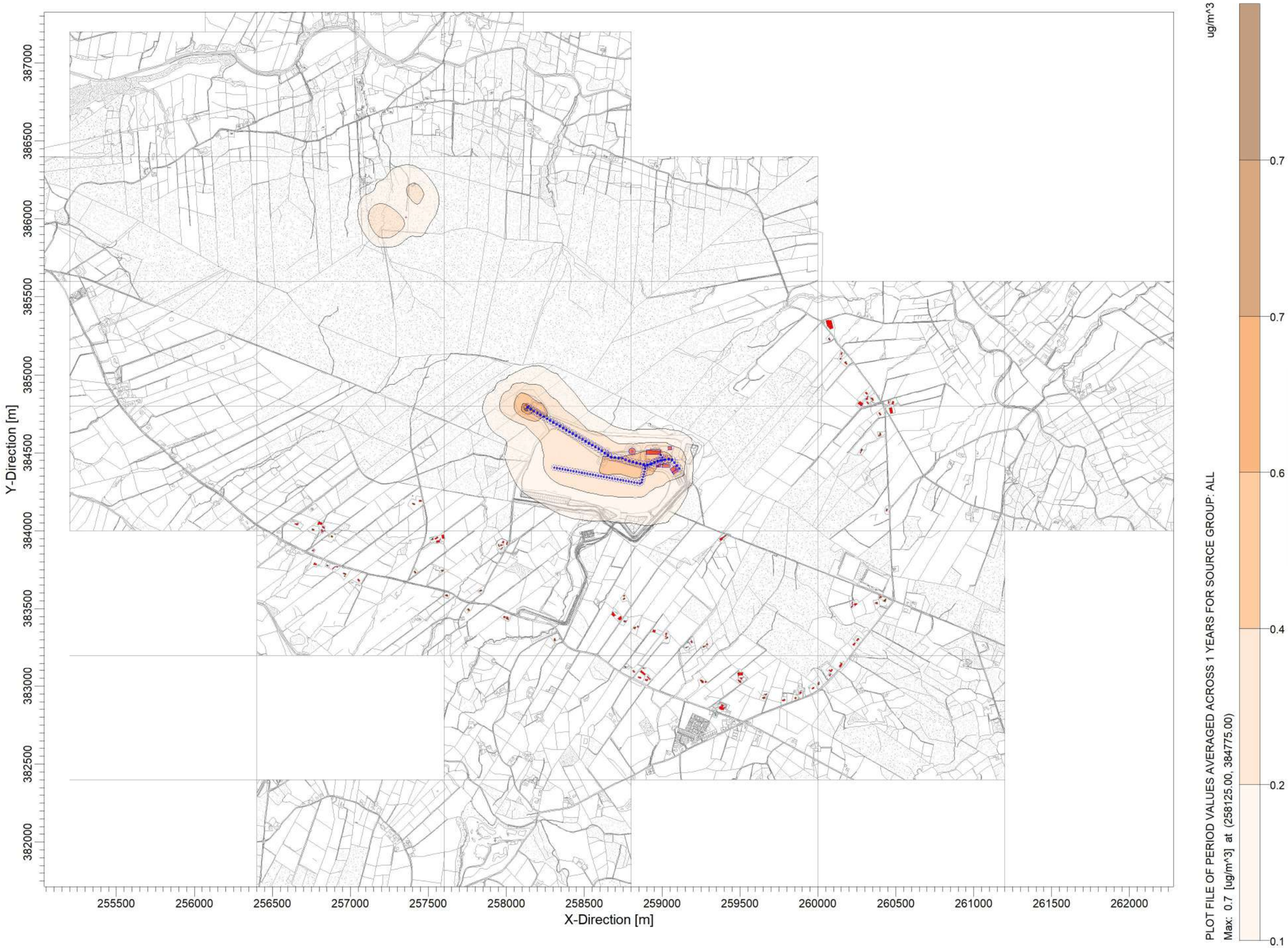
0 0.5 km

PROJECT NO.:

ENV-1532

PROJECT TITLE:

Figure 7: Curraghinalt Project, Dalradian Gold Ltd. Annual Mean Nitrogen Dioxide (NO2) emissions from Underground Mining sources, Surface Support Equipment, TSF Management and Process Plant emissions. Scenario 2 - Life of Mine Average of 1,717,175 million litres of HVO / annum. . NO2 EAL = 40 ug/m3 [from Air Quality Standards].



COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

1465

OUTPUT TYPE:

Concentration

MAX:

0.7 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

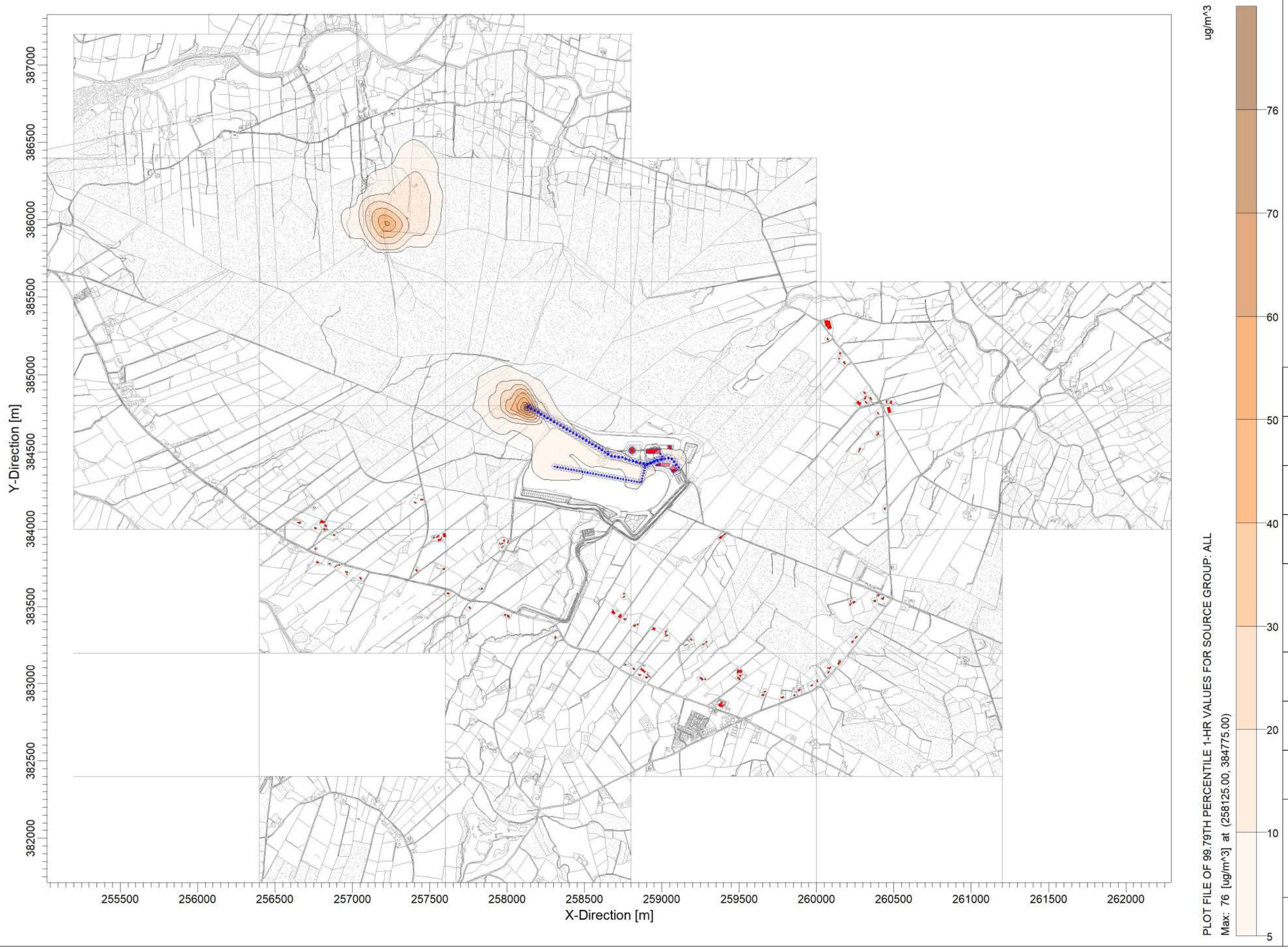
0 0.5 km

PROJECT NO.:

ENV-1532

PROJECT TITLE:

Figure 8: Curraghinalt Project, Dalradian Gold Ltd. 99.79th %ile of 1-Hour Nitrogen Dioxide (NO2) emissions from Underground Mining sources, Surface Support Equipment, TSF Management and Process Plant emissions.



COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

1465

OUTPUT TYPE:

Concentration

MAX:

76 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

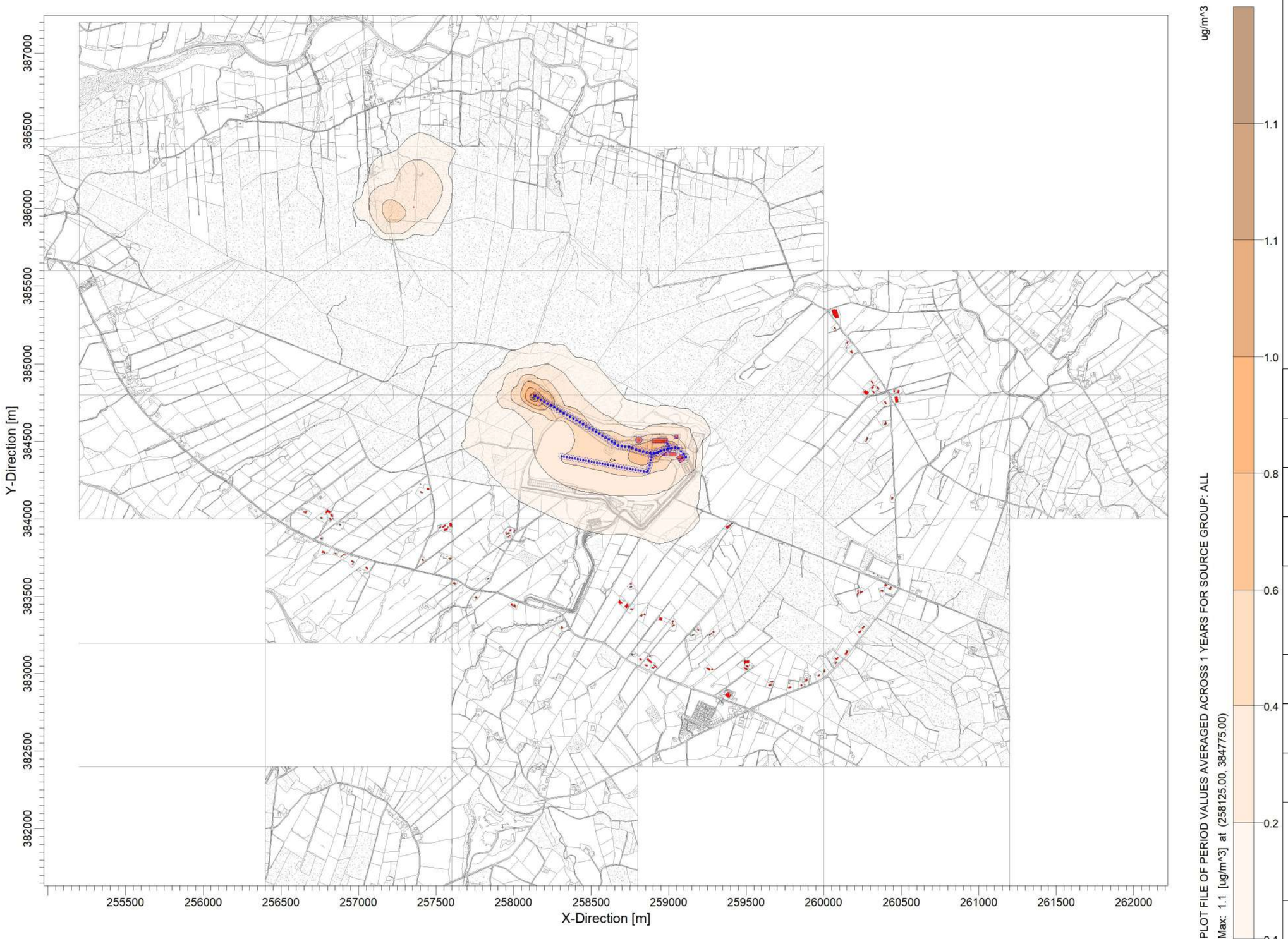
0 0.5 km

PROJECT NO.:

ENV-1532

PROJECT TITLE:

Figure 9: Curraghinalt Project, Dalradian Gold Ltd. Annual Mean Nitrogen Dioxide (NO2) emissions from Underground Mining sources, Surface Support Equipment, TSF Management and Process Plant emissions. Scenario 3 - Annual Peak of 2,143,407 million litres of diesel / annum. . NO2 EAL = 40 ug/m3 [from Air Quality Standards].



COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

1465

OUTPUT TYPE:

Concentration

MAX:

1.1 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

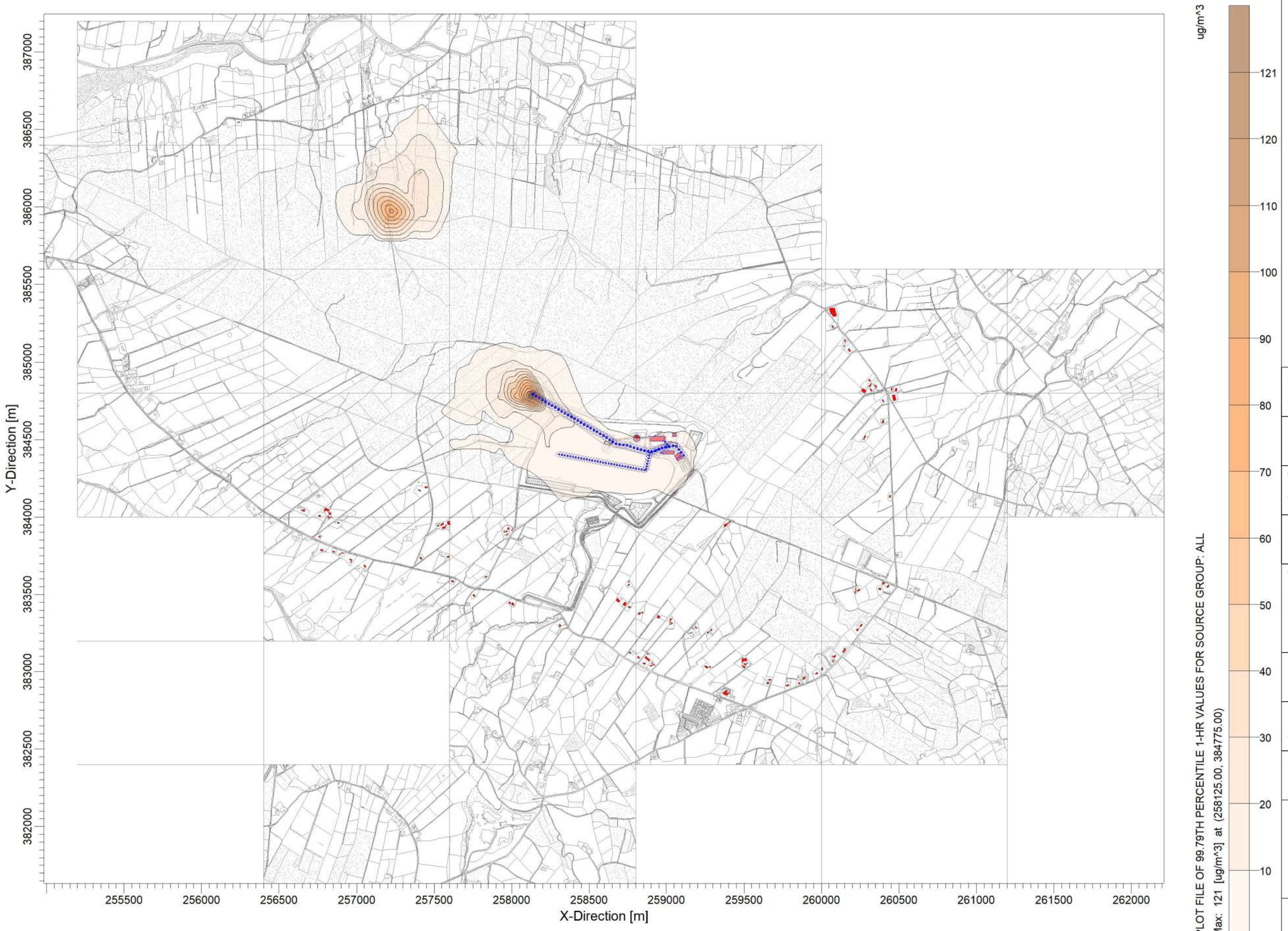
0 0.5 km

PROJECT NO.:

ENV-1532

PROJECT TITLE:

Figure 10: Curraghinalt Project, Dalradian Gold Ltd. 99.79th %ile of 1-Hour Nitrogen Dioxide (NO2) emissions from Underground Mining sources, Surface Support Equipment, TSF Management and Process Plant emissions.



COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

1465

OUTPUT TYPE:

Concentration

MAX:

121 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

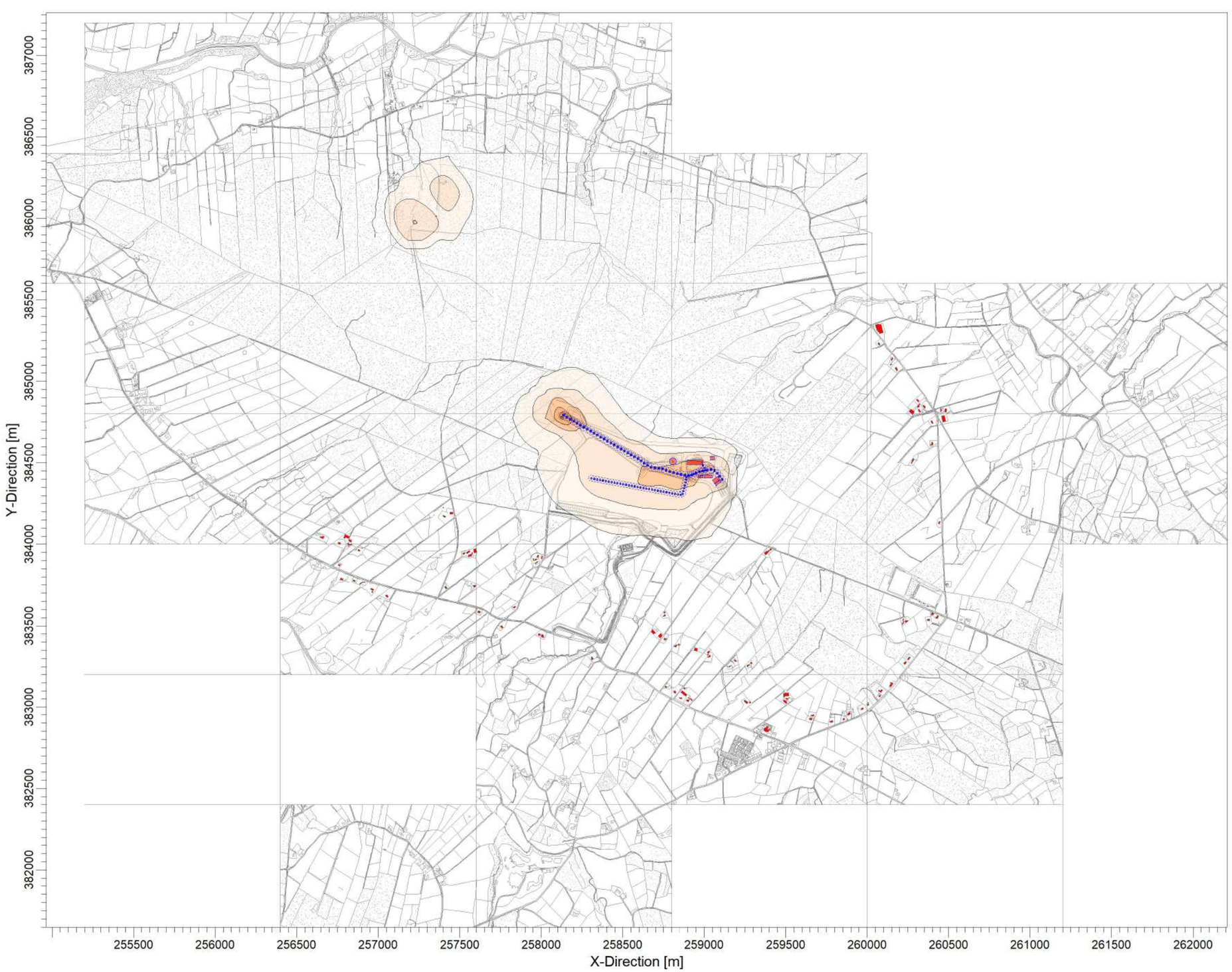
0 0.5 km

PROJECT NO.:

ENV-1532

PROJECT TITLE:

Figure 11: Curraghinalt Project, Dalradian Gold Ltd. Annual Mean Nitrogen Dioxide (NO2) emissions from Underground Mining sources, Surface Support Equipment, TSF Management and Process Plant emissions. Scenario 4 - Annual Peak of 2,143,407 million litres of HVO / annum. NO2 EAL = 40 ug/m3 [from Air Quality Standards].



COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

1465

OUTPUT TYPE:

Concentration

MAX:

0.8 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

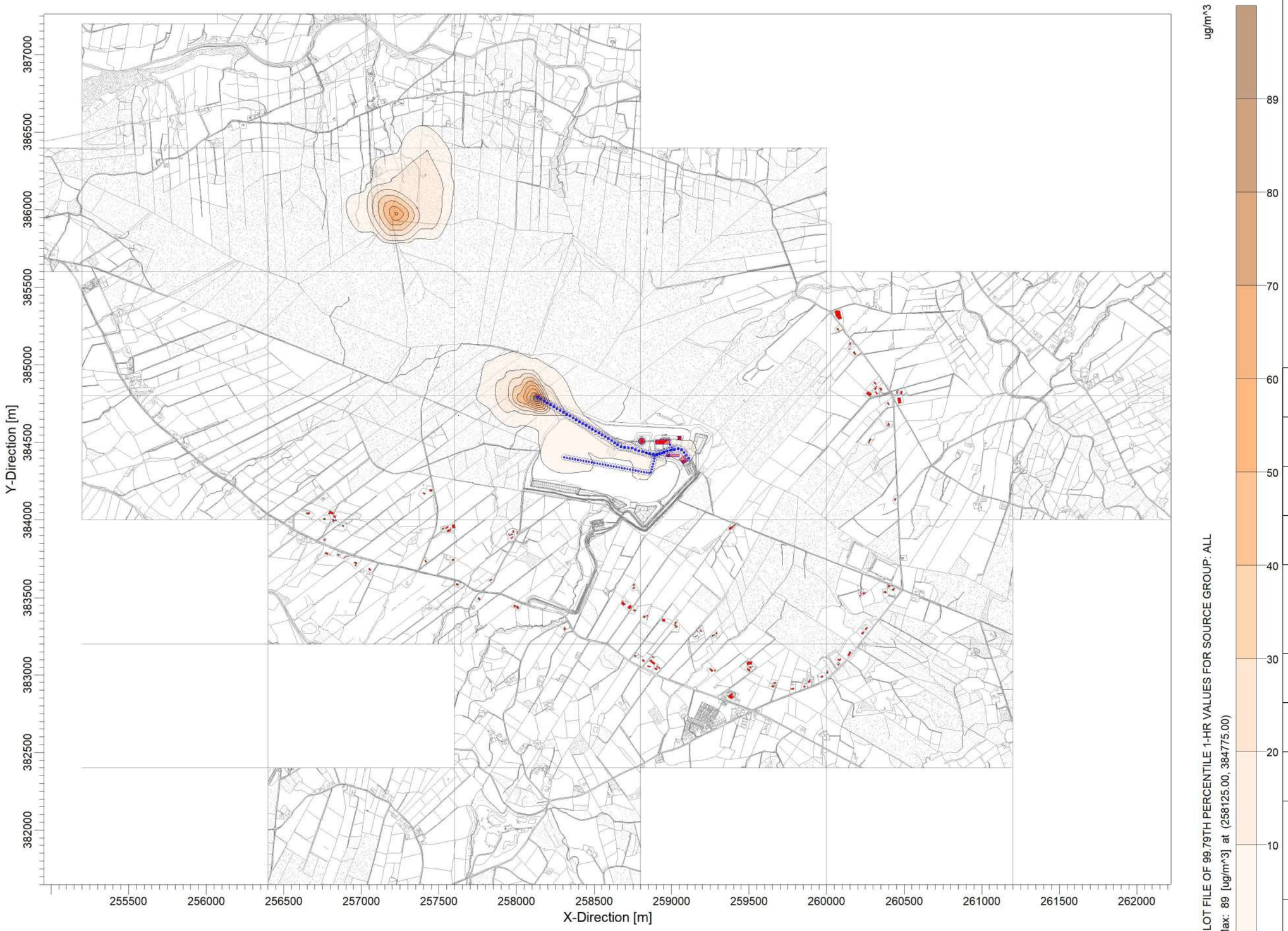
0 0.5 km

PROJECT NO.:

ENV-1532

PROJECT TITLE:

Figure 12: Curraghinalt Project, Dalradian Gold Ltd. 99.79th %ile of 1-Hour Nitrogen Dioxide (NO2) emissions from Underground Mining sources, Surface Support Equipment, TSF Management and Process Plant emission.



COMMENTS:

Values presented as ug/m3

SOURCES:

5

RECEPTORS:

1465

OUTPUT TYPE:

Concentration

MAX:

89 ug/m^3

COMPANY NAME:

AONA Environmental Consulting Ltd.

MODELER:

MK

DATE:

26/11/2025

SCALE: 1:25,000

0 0.5 km

PROJECT NO.:

ENV-1532

Appendix A - Discussion of Potential Dust Deposition Impacts at Pollanroe Burn

1.1 The Updated Air Dispersion Modelling and Air Quality Impact Assessment Report for the Curraghinalt Gold Mine Project has focussed on the potential impact of nitrogen oxides (NOx) and nitrogen deposition rate from the proposed DGL Curraghinalt Project in accordance with the methodology outlined in the Northern Ireland Environment Agency (NIEA) Revised Operational Protocol for Assessing Ammonia and Air Pollution Impacts on the Natural Environment (issued by NIEA on 28th February 2025).

1.2 However, in their most recent submission, Loughs Agency has stated that impacts on Pollanroe Burn due to dust deposition have the potential to impact species such as macroinvertebrates, which are a food source for Atlantic salmon, reducing the availability of food for Atlantic salmon.

1.3 The Institute of Air Quality Management (IAQM) states that "*dust can have two types of effect on vegetation: physical and chemical. Direct physical effects include reduced photosynthesis, respiration and transpiration through smothering. Chemical changes to soils or watercourses may lead to a loss of plants or animals for example via changes in acidity*".

1.4 The potential for such physical changes to occur in a watercourse such as Pollanroe Burn due to physical 'smothering' with dust would require a very high dust deposition rate over a long-term at Pollanroe Burn.

1.5 Interim Advice Note (IAN) prepared as a supplement to the Design Manual for Roads and Bridges (Volume 11, Section 3, Part 1 of the Design Manual for Roads and Bridges and now incorporated into HA207/07) suggests that dust deposition levels above 1,000 mg/m^2/day are likely to affect sensitive ecological receptors. Annex F, Assessment of Designated Sites states "*F1.5 Deposition of particles, ammonia, metals and salt will also be increased close to the road. This could affect vegetation in a number of ways: i) Dust or particles falling onto plants can physically smother the leaves affecting photosynthesis, respiration and transpiration. The literature suggests that the most sensitive species appear to be affected by dust deposition at levels above 1000 mg/m^2/day which is five times greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. Most species appear to be unaffected until dust deposition rates are at levels considerably higher than this*".

1.6 The UK Highways Agency guideline (2005) has since been updated several times. The 2005 version has not been used for 16 years. The latest guidance for 2019 no longer presents limit values for dust deposition. A review of The Effects Of Dust On Vegetation (Farmer, 1993) provides a comprehensive review of the literature on the effects of dust on plants and their communities. In the review it is stated that "*Spatt & Miller (1981) found that Sphagnum lenense near a road and subject to dust deposition had a decreased photosynthetic rate and chlorophyll a content. The species had declined beside the roadside, where deposition was 1.0-2.55 g/m^2/day. However, they could still detect effects of the dust at a distance from the road where the deposition rate was only 0.07 g/m2/day*". This equates to a dust deposition rate of 70 mg/m^2/day and 25 g/m^2/year. It is also important to note that the dust deposition rate limit of 70 mg/m^2/day refers to terrestrial receivers

locations. Naturally, such a dust deposition rate in a stream or river will be diluted significantly by the water in the watercourse.

1.7 The predicted dust deposition rates are presented in ANNEX A, Air Quality & Dust Dispersion Model Outputs, Figures 1 – 4 in the Curraghinalt Gold Mine Project, Air Quality & Dust Impact Assessment, Second Addendum (Date: October 2020) as prepared by AONA Environmental Consulting Ltd.

1.8 The dust deposition model outputs throughout the life-time of the mine clearly indicate that no dust deposition rate in excess of 70 mg/m^2/day will occur at Pollanroe Burn. The predicted dust deposition rates from the dry stack operations in proximity to Pollanroe Burn are <5 mg/m^2/day throughout the life-time of the mine and clearly indicate that no significant dust deposition rate will occur at Pollanroe Burn.

1.9 The Medium Combustion Plant (MCP) Screening Tool outputs describes the relevant ecological receivers within the 15 Km radius of the DGL site.

1.10 It is noteworthy that the Medium combustion plant (MCP) Screening Tool Report Outputs state that 'Standing open water and canals' and 'Rivers and streams' sites in proximity to the DGL site are not listed as being sensitive sites in terms of NOx concentrations, nitrogen deposition and/or dust deposition.

Appendix A - Table 1: MCP Screening Tool Report Outputs – sensitive sites in proximity to the DGL site.

Interest Sites and ecological receivers found. *The search found the following 46 relevant* ecological receivers *within a 15 Km radius.*

Site Code	Designation	Site Name	Receiver Name	Receiver Common Name	Receiver Type	Broad Habitat	Interest Code	Sensitivity to Acidity	Sensitivity to Acidity - Species	Sensitivity to N	Sensitivity to N - Species	Sensitivity to NOx - Species	Sensitivity to SO2 - Species	Sensitivity TO NH3 - Species	Acidity Code
UK0016608	SAC	Teal Lough	Natural dystrophic lakes and ponds	Acid peat-stained lakes and ponds	Habitat	Standing open water and canals	H3160	Yes	Not Applicable	Yes	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Freshwater
UK0030233	SAC	Owenkillew River	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	Rivers with floating vegetation often dominated by water-crowfoot	Habitat	Rivers and streams	H3260	Yes	Not Applicable	Yes	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Freshwater
UK0030296	SAC	Upper Ballinderry River	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	Rivers with floating vegetation often dominated by water-crowfoot	Habitat	Rivers and streams	H3260	Yes	Not Applicable	Yes	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Freshwater
UK0016608	SAC	Teal Lough	Northern Atlantic wet heaths with Erica tetralix	Wet heathland with cross-leaved heath	Habitat	Dwarf shrub heath	H4010	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Dwarf shrub heath
UK0016608	SAC	Teal Lough	European dry heaths	Dry heaths	Habitat	Dwarf shrub heath	H4030	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Dwarf shrub heath
UK0030324	SAC	Deroran Bog	Active raised bogs	Active raised bogs	Habitat	Bogs	H7110	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
UK0016609	SAC	Black Bog	Active raised bogs	Active raised bogs	Habitat	Bogs	H7110	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
UK0030324	SAC	Deroran Bog	Degraded raised bogs still capable of natural regeneration	Degraded raised bog	Habitat	Bogs	H7120	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
UK0016609	SAC	Black Bog	Degraded raised bogs still capable of natural regeneration	Degraded raised bog	Habitat	Bogs	H7120	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs

UK0030296	SAC	Upper Ballinderry River	Blanket bogs (* if active bog)	Blanket bog	Habitat	Bogs	H7130	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
UK0016608	SAC	Teal Lough	Blanket bogs (* if active bog)	Blanket bog	Habitat	Bogs	H7130	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
UK0016608	SAC	Teal Lough	Depressions on peat substrates of the Rhynchosporion	Depressions on peat substrates	Habitat	Bogs	H7150	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
UK0030233	SAC	Owenkillew River	Old sessile oak woods with Ilex and Blechnum in the British Isles	Western acidic oak woodland	Habitat	Broadleaved, mixed and yew woodland	H91A0	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Unmanaged Broadleafed / Coniferous Woodland
UK0030296	SAC	Upper Ballinderry River	Old sessile oak woods with Ilex and Blechnum in the British Isles	Western acidic oak woodland	Habitat	Broadleaved, mixed and yew woodland	H91A0	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Unmanaged Broadleafed / Coniferous Woodland
UK0030233	SAC	Owenkillew River	Bog woodland	Bog woodland	Habitat	Broadleaved, mixed and yew woodland	H91D0	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
UK0030296	SAC	Upper Ballinderry River	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	Alder woodland on floodplains	Habitat	Broadleaved, mixed and yew woodland	H91E0	No	Not Applicable	No	Not Applicable	Yes	Yes	Yes	Not Sensitive
UK0030233	SAC	Owenkillew River	Margaritifera margaritifera	Freshwater pearl mussel	Mollusc	Rivers and streams	S1029	Yes	Yes	Yes	Site specific	Site specific	no data	Site specific	Freshwater
UK0030296	SAC	Upper Ballinderry River	Margaritifera margaritifera	Freshwater pearl mussel	Mollusc	Rivers and streams	S1029	Yes	Yes	Yes	Site specific	Site specific	no data	Site specific	Freshwater
UK0030233	SAC	Owenkillew River	Lutra lutra	Otter	Mammal	Rivers and streams	S1355	Yes	Yes	Yes	Site specific	Site specific	no data	Site specific	Freshwater
UK0030296	SAC	Upper Ballinderry River	Lutra lutra	Otter	Mammal	Rivers and streams	S1355	Yes	Yes	Yes	Site specific	Site specific	no data	Site specific	Freshwater
UK0030296	SAC	Upper Ballinderry River	Austropotamobius pallipes	White-clawed (or Atlantic	Crustacean	Rivers and streams	S1092	Yes	Site specific	Yes	Site specific	Site specific	no data	Site specific	Freshwater

				stream) crayfish											
UK0030233	SAC	Owenkillew River	Lampetra planeri	Brook lamprey	Fish	Rivers and streams	S1096	Yes	Yes	Yes	Site specific	Site specific	no data	Site specific	Freshwater
UK0030233	SAC	Owenkillew River	Salmo salar	Atlantic salmon	Fish	Rivers and streams	S1106	Yes	Yes	Yes	Site specific	Site specific	no data	Site specific	Freshwater
UK0030296	SAC	Upper Ballinderry River	Salmo salar	Atlantic salmon	Fish	Rivers and streams	S1106	Yes	Yes	Yes	Site specific	Site specific	no data	Site specific	Freshwater
ASSI007	SSSI	Black Bog	Lowland raised bog	Lowland raised bog	Habitat	Bogs	SSSI0153	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
ASSI035	SSSI	Deroran Bog	Lowland raised bog	Lowland raised bog	Habitat	Bogs	SSSI0153	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
ASSI011	SSSI	Teal Lough and Slaghtfreeden Bogs	Invertebrate assemblage	Invertebrate Assemblage	Invertebrate	No broad habitat assigned	SSSI0750	Yes	Site specific	Yes	Site specific	Site specific	no data	Site specific	No Comparable Acidity Class
ASSI199	SSSI	Upper Ballinderry River	Lutra lutra	Otter	Mammal	Rivers and streams	SSSI0879	Yes	Yes	Yes	Site specific	Site specific	no data	Site specific	Freshwater
ASSI213	SSSI	Owenkillew River	Lutra lutra	Otter	Mammal	Rivers and streams	SSSI0879	Yes	Yes	Yes	Site specific	Site specific	no data	Site specific	Freshwater
ASSI199	SSSI	Upper Ballinderry River	Margaritifera margaritifera	Freshwater Pearl Mussel	Mollusc	Rivers and streams	SSSI0895	Yes	Yes	Yes	Site specific	Site specific	No expected negative impact on species due to impacts on the species' broad habitat.	Site specific	Freshwater
ASSI213	SSSI	Owenkillew River	Margaritifera margaritifera	Freshwater Pearl Mussel	Mollusc	Rivers and streams	SSSI0895	Yes	Yes	Yes	Site specific	Site specific	No expected negative impact on species due to impacts on the species'	Site specific	Freshwater

													broad habitat.		
ASSI396	SSSI	Owenreagh River	Margaritifera margaritifera	Freshwater Pearl Mussel	Mollusc	Rivers and streams	SSSI0895	Yes	Yes	Yes	Site specific	Site specific	No expected negative impact on species due to impacts on the species' broad habitat.	Site specific	Freshwater
ASSI213	SSSI	Owenkillew River	Salmo salar	Atlantic Salmon	Fish	Rivers and streams	SSSI1314	Yes	Yes	Yes	Site specific	Site specific	No expected negative impact on species due to impacts on the species' broad habitat.	Site specific	Freshwater
ASSI011	SSSI	Teal Lough and Slaghtfreeden Bogs	Blanket bog	Blanket bog	Habitat	Bogs	SSSI1715	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
ASSI203	SSSI	Murrins	Blanket bog	Blanket bog	Habitat	Bogs	SSSI1715	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
ASSI309	SSSI	Mullaghcarn	Blanket bog	Blanket bog	Habitat	Bogs	SSSI1715	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs
ASSI203	SSSI	Murrins	Dry heath	Dry heath	Habitat	No broad habitat assigned	SSSI1730	Yes	Not Applicable	Yes	Not Applicable	Not Applicable	Yes	Highly	Dwarf shrub heath
ASSI309	SSSI	Mullaghcarn	Dry heath	Dry heath	Habitat	No broad habitat assigned	SSSI1730	Yes	Not Applicable	Yes	Not Applicable	Not Applicable	Yes	Highly	Dwarf shrub heath
ASSI055	SSSI	Crockaghole Wood	Oakwood	Oakwood	Habitat	Broadleaved, mixed and yew woodland	SSSI1749	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Unmanaged Broadleafed / Coniferous Woodland
ASSI056	SSSI	Drumlea and Mullan Woods	Oakwood	Oakwood	Habitat	Broadleaved, mixed and	SSSI1749	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Unmanaged Broadleafed

						yew woodland									/ Coniferous Woodland
ASSI062	SSSI	Owenkillew and Glenelly Woods	Oakwood	Oakwood	Habitat	Broadleaved, mixed and yew woodland	SSSI1749	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Unmanaged Broadleafed / Coniferous Woodland
ASSI213	SSSI	Owenkillew River	Oakwood	Oakwood	Habitat	Broadleaved, mixed and yew woodland	SSSI1749	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Unmanaged Broadleafed / Coniferous Woodland
ASSI309	SSSI	Mullaghcarn	Oakwood	Oakwood	Habitat	Broadleaved, mixed and yew woodland	SSSI1749	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Unmanaged Broadleafed / Coniferous Woodland
ASSI203	SSSI	Murrins	Wet heath	Wet heath	Habitat	Dwarf shrub heath	SSSI1756	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Dwarf shrub heath
ASSI309	SSSI	Mullaghcarn	Wet heath	Wet heath	Habitat	Dwarf shrub heath	SSSI1756	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Dwarf shrub heath
ASSI056	SSSI	Drumlea and Mullan Woods	Wet woodland	Wet woodland	Habitat	Broadleaved, mixed and yew woodland	SSSI1758	Yes	Not Applicable	Yes	Not Applicable	Yes	Yes	Yes	Bogs

TECHNICAL DATA SHEET

Subtek™ Velcro

UK

Description

Subtek™ Velcro bulk emulsion explosive is a primer sensitive pumped explosive which has the appearance of an opaque fluid, similar in viscosity to heavy grease. *Subtek™ Velcro* has excellent water resistance as an inherent characteristic of an emulsion explosive.

Application

Subtek™ Velcro is manufactured at the blast site from an Orica designed underground pumping unit. This combines non-explosive emulsion with sensitiser to deliver the water resistant explosive product into the blasthole. The density of the final product can be varied to suit ground conditions or blast design. *Subtek™ Velcro* is specifically designed for use in upholes and is also suitable for downholes and development headings.

Key Benefits

- *Subtek™ Velcro* has been designed specifically to provide enhanced retention in upholes in underground mining.
- The final product density of *Subtek™ Velcro* can be varied to match desired product performance criteria.
- *Subtek™ Velcro* pumped emulsion reduces spillage and with excellent water resistance, minimises nitrate leaching and the resultant environmental impact.
- *Subtek™ Velcro* provides fully coupled explosive to maximise blasting outcomes.
- The increased speed of charging and reduced post-blast fumes when using *Subtek™ Velcro*, dramatically improves stope turnaround time.
- *Subtek™ Velcro* reduces potential for sulphide dust explosions.
- Occupational Health & Safety issues around the handling and storage of packaged products is eliminated.

Recommendations for Use

Blasthole Charge Length

Subtek™ Velcro is suitable for use in holes of up to 50 m in length, depending on hole diameter, inclination and presence of water. Mechanical retention devices may be required under certain circumstances. For use in downholes please contact Orica Technical Services Personnel for further information.

Technical Properties

Product	*Subtek™ Velcro*				
Density (g/cm³) [1]	0.8	0.9	1.0	1.1	1.2
Minimum Blasthole Diameter (mm) [2]	38	38	38	38	42
Hole Type	Wet and dry				
Delivery System	Pumped				
Typical VOD (km/s) [3]	4.5	4.9	5.3	5.7	6.2
Relative Effective Energy (REE) [4]					
Relative Weight Strength (%)	72	78	85	92	98
Relative Bulk Strength (%)	72	89	106	127	147
CO_2 Output (kg/t) [5]	183				
Sleep time (months)	3				

Priming and Initiation

Subtek™ Velcro can be reliably initiated using a *Pentex™* primer or equivalent in conjunction with an *Exel™* detonator. *Pentex™* primers must be appropriate to the blasthole size. Use of detonating cord with *Subtek™ Velcro* is not recommended. Contact Orica Technical Service Personnel for further information.

Charging

Charging is carried out using specialised proprietary underground pumping equipment. Retention of the explosive in a blasthole will depend on hole diameter, inclination, cleanliness of the hole and presence of water. Contact Orica Technical Service Personnel for further information.

Sleep-Time within Blastholes

The recommended maximum sleep time is 3 months. Sleep time is dependent on factors such as hole diameter, density, ground water conditions, initiation system and mining method. Orica Mining Services Technical Personnel should be consulted if special conditions exist.

Gassing

The gassing rate of *Subtek™ Velcro* is temperature dependent. Typical gassing time is approximately 30 minutes at 30 °C. Sixty minutes should be allowed between loading and firing blastholes at 25 °C.

Subtek™ Velcro

UK

Ground Temperature

These products are available for use in ground temperatures 0 °C to a maximum of 55 °C. If your application requires you to operate outside this temperature range, please contact your local Orica Account Manager.

Storage and Handling

Product Classification

Authorised Name:	*Subtek™ Velcro*
Proper Shipping Name:	Explosive, Blasting, Type E
UN No.:	0241
Classification:	1.1D
EC Type Certificate:	ENB/B/090/09

All regulations pertaining to the handling and use of such explosives apply.

Disposal

Disposal of explosive materials can be hazardous. Methods of safe disposal of explosives may vary depending on the user's situation. Please contact a local Orica representative for information on safe practices.

Safety

The post detonation fume characteristics of *Subtek™ Velcro* make it suitable for underground blasting applications. Users should ensure that adequate ventilation is provided prior to re-entry into the blast area.

Subtek™ Velcro is relatively insensitive to accidental initiation by shock, friction or mechanical impact under normal conditions of use. Detonation may occur from heavy impact or excessive heating particularly under conditions of confinement.

Explosives based on Ammonium Nitrate such as the Subtek™ Velcro may react with pyritic materials in the ground and create potentially hazardous situations. Orica accepts no responsibility for any loss or liability arising from use of the product in ground containing pyritic or other reactive material.

Disclaimer

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Emergency Telephone Numbers

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Notes

1. Nominal Density Only.
2. Contact your local Orica Representative for further advice on loading at minimum hole diameters.
3. VOD will depend on application including explosive density blasthole diameter and degree of confinement. The VOD range is based on minimum unconfined and calculated ideal.
4. REE is the Effective Energy relative to ANFO at a density of 0.8 g/cm^3. ANFO has an effective energy of 2.30 MJ/kg. Energies quoted are based on ideal detonation calculations with a 100 Mpa cut off pressure. Non-ideal detonation energies are also available on request. These take account of blasthole diameter, rock type and explosive reaction behaviour.
5. Carbon dioxide is the main greenhouse gas produced. The output is calculated assuming ideal detonation.

TECHNICAL DATA SHEET

Subtek™ Velcro ANE
Ammonium Nitrate Emulsion Phase

Description
Subtek™ Velcro Ammonium Nitrate Emulsion Phase (ANE) is the emulsion component or precursor that is combined with sensitizer to deliver the explosives of the Subtek™ Velcro explosives system. Subtek™ Velcro is specifically designed for use in upholes and is also suitable for downholes and development headings.

Subtek™ Velcro ANE is oxygen balanced and appears as an opaque, white or cream coloured viscous fluid, similar to a light grease or heavy oil.

Application
Subtek™ Velcro ANE is manufactured by Orica to the highest quality standards and is delivered via tanker trucks, ISO tanks or IBC containers into appropriate holding tanks at the mine.

Subtek™ Velcro ANE can be only used to manufacture authorised Subtek™ Velcro explosive products. Before mixing at any specific site, licenses are required from the appropriate Regulatory Authority.

Technical Properties
Subtek™ Velcro ANE is an explosive precursor. Technical properties related to its explosive characteristics can be found on the Subtek™ Velcro technical data sheet.

Subtek™ Velcro ANE Density 1.31 ±0.03 g/cm^3

Recommendations for Use
Subtek™ Velcro ANE is recommended for manufacturing Subtek™ Velcro products. Contact your local Orica Explosives Technical representatives for advice.

Ground Temperature
Subtek™ Velcro ANE is suitable for products used in ground temperatures of 0 °C to a maximum of 55 °C. If your application requires you to operate outside this temperature range, please contact your Orica Account Manager.

Storage and Handling
Product Classification

Authorised Name:	ANE 200
Proper Shipping Name:	Ammonium Nitrate Emulsion
UN No.:	3375
Classification:	5.1

Storage
Subtek™ Velcro ANE can be stored on site for up to 3 months before use. However, the formation of crystals in the emulsion is the first sign of the product reaching the end of its life span. If practical, oldest stock should be used first.

If there is any concern with the product quality an Orica Explosives Technical Representative should be contacted.

Disposal
Disposal of explosive materials can be hazardous. Methods of safe disposal of explosives may vary depending on the user's situation. Please contact a local Orica representative for information on safe practices.

Safety
Subtek™ Velcro ANE is relatively insensitive to accidental initiation by shock, friction or mechanical impact under normal conditions of use. Detonation may occur from heavy impact or excessive heating particularly under conditions of confinement.

Explosives based on Ammonium Nitrate such as the Subtek™ Velcro ANE may react with pyritic materials in the ground and create potentially hazardous situations. Orica accepts no responsibility for any loss or liability arising from use of the product in ground containing pyritic or other reactive material.

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